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Recent Literature on Geomagnetism
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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY is a monthly publication devoted to:

A. Current Abstracts in English on important meteorological literature in every language.

B. Bibliographic references to other items of interest to the profession.

C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 9 OCTOBER 1958 No. 10

SPECIAL FEATURE IN THIS ISSUE

Recent Literature on Geomagnetism

By

Mary L. Rice and Robert Panara

(*For complete table of contents see back cover*)

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LIST OF PERIODICALS

Note: This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted. The form of serial entry adopted by MAB is given in bold face type below.

PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

★**Acta Geophysica Polonica,** [Warsaw]
Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and Ser. Geofiz., [Moscow].
American Geophysical Union, Transactions, [Washington].
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B,** [Vienna].
Australian Journal of Physics, [Melbourne].
★**Australian Meteorological Magazine,** [Melbourne].
★**Ciel et Terre,** Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
Geofisica Pura e Applicata, Istituto Geofisico Italiano, [Milan].
★**Geophysical Magazine,** Japan Meteorological Agency, [Tokyo].
Hemel en Dampkring, [The Hague].
★**Időjárás,** Magyar Meteorológiai Társaság and Országos Meteorológiai Intézet, [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorologické Zprávy** [Prague].
★**Meteorological Society of Japan, Journal,** [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologiia i Gidrologiia,** [Leningrad].
★**Meteorologische Rundschau,** [Berlin].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
Polarforschung, Archiv für Polarforschung, [Kiel].
★**Przegląd Meteorologiczny i Hydrologiczny,** [Warsaw].
Revista de Geofísica, Instituto Nacional de Geofisica, [Madrid].
★**Revista Meteorológica,** Junta Nacional de Meteorología, Montevideo.
★**Rivista di Meteorologia Aeronautica,** Servizio Meteorologico, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
★**South Africa, Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society, [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises an annotated bibliography of important references on a special subject (usually arranged chronologically). No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

1. Atmos. Pollution 2. Aerobiology 3. Cloud Physics 4. Hail
5. Tornadoes 6. Volcanic Dust 7. Climat. Changes 8. Thunderstorms
9. Icing 10. Acoust. Propagation 11. Evaporation

Vol. II, 1951

1. Extended Forecast. 2. Long Range Forecast. 3. Soil Temp. 4. Constants, etc.
5. Clim. of Near East 6. Clim. of Middle East 7. Special Winds 8. Radar Storm Detect.
9. Condensation Trails 10. Clim. of N.E. Africa 11. Mountain Met.

Vol. III, 1952

1. Clim. of N.W. Africa 2. Carbon Dioxide 3. Clim. of Argentina, etc. 4. Dew
5. Objective Forecast. 6. Stratus Forecast. 7. Urban Climatology 8. Clim. of C. Africa
9. Visibility 10. Glaze and Rime 11. Free Air Turbulence

Vol. IV, 1953

1. Turbulence Theory 2. Turbulent Diffusion 3. Frost 4. Clim. of Australia, etc.
5. High Level Winds 6. Winds in Stratosphere 7. Jet Stream 8. Radiation Bioclim.
9. Clim. of Pacific 10. Auroras 11. Sferics

Vol. V, 1954

1. Oceanog. Met. 2. Clim. of S.E. Asia 3. Auroral Physics 4. Tropopause
5. Balloons 6. Numerical Forecast. 7. Radiation Data 8. Vertical Motion
9. Clim. of Arctic 10. Industrial Met. 11. Wind Waves and Swell

Vol. VI, 1955

1. Bibliog. of Bibliog. 2. Texts & Monogr. Bibliogs. 3. Storm Surges
4. Ionospheric Prop. 5. Photochem.—Upper Atmos. 6. Cloud Physics
7. Radar Cloud Physics 8–9. Atmos. Nuclei 10. Weather Modification 11. Cooling Power

Vol. VII, 1956

1. Synoptic Met.-Arctic 2. Clim. of Enclosed Spaces 3. Cosmic Rays (–1952)
4. Cosmic Rays (1953–56) 5. Atmos. Radioactivity 6. Inversions
7. Snow Micromet. 8. Snow Micromet. (Suppl.) 9–11. Tropical Cyclones

Vol. VIII, 1957

1. Solar Weather Relations 2. Night Airglow 3. Forecasting Special Elements
4. Forest Micrometeorology 5. Hydromet. Forecasting 6. Numerical Forecasting (Suppl.)
7. Albedo 8. Meteors 9–10. Tropospheric Propagation 11. Medical Meteorology

Vol. IX, 1958

1. Radioastronomy 2. Solar Astrophysics 3. Radioactivity in Atmosphere
4. Waves and Currents 5. Physical Oceanog. 6. Dynamic & Phys. Oceanog.
7. Long Range Forecasting 8. Radar Met. 9. Cosmic Rays 10. Geomagnetism

Other bibliographies in preparation are:

Actinometers	*Mesometeorology*	*Radiation*
Geomagnetism (Pt. 2)	*Micrometeorology*	*Singularities*
High Atmosphere Temperatures	*Ozone*	*Synoptic Aerology*

Part III contains a listing of reviews, translations, reprints, and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue comprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where th material may be found. The Union List of Serials (Gregory) is the source of most of th symbols used. In some cases, where no symbol has been assigned to a library, one will b devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwis stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to th Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months ar abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Numbe (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus a entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

COLLECTED WORKS

9.10–1 551.509.31

Visscher, H. B. et al., **Development of practical, short-range, weather prediction techniques.** Eastern Air Lines, Inc. Meteorology Dept., Contract AF 19(604)-1066, Scientific Report, No. 1, Dec. **1955.** 127 p. 61 figs., tables, 15 refs. Contents: Funke, P. W., **Movement of mountain lows,** p. 5–16. Shafer, R. J., **Technique for predicting the 24-hour prognostic surface chart,** p. 17–34. Whiting, R. M. and Biggers, W. R., **Appalachian line squalls,** p. 35–50. Bailey, R. E. and Hilworth, J. T., **Movement of cold lows at the 500 millibar level, and their influence on surface lows,** p. 62–79. Visscher, H. B., **Cloud forecasting,** p. 80–98. (All articles abstracted separately.) **DWB**—A supplementary method is developed for the movement of certain classes of mountain lows west of 95° long. This method corrects and refines that portion of Scientific Report, No. 2, which dealt with these mountain lows. A technique is developed to aid in drawing prognostic charts, particularly under conditions when there is no strong development or strong system susceptible to treatment under previous objective techniques. The method involves prediction, first of the 700 mb prognostic chart and secondly, the 850 mb thermal pattern. Using these two, a surface chart is developed. A method for predicting those line squalls which form along the Appalachian Mountains during the summertime is developed and described. It involves the location of surface fronts and micro-structure of the 500 mb chart. The problem of forecasting local thunderstorms which are not associated with fronts or line squalls is investigated and a method for predicting them based upon radiosonde data is devised. Wind shear is used to eliminate some negative areas. A method of predicting the movement of cold lows at the 500 mb level is devised. Wave length and confluence parameters are used. The relation between the low at 500 mb and the capturing process of the surface low is examined and a method for predicting the surface low position is described. The complex problem of predicting clear skies using 500 mb parameters is investigated and detailed methods for predicting likely areas, and the attendant probability is given. *Subject Headings:* **1. Short range forecasting 2. Prognostic chart preparation.**—*Authors' abstract.*

9.10–2 551.501.9

Blue Hill Meteorological Observatory, **Final Report, 1951/1952,** on Contract Cwb-8163, pub. **1953.** 55 p. 14 figs., 24 eqs., tables, refs. throughout. (For **Final report, 1952/1953,** *see* 6.9–2, Oct. 1955, *MAB.*) **Semi-annual Progress Report, 1953/1954,** on Contract Cwb-8381, pub. 1954. 19 p. figs., tables, refs. **Final Report, 1953/1954,** on Contract Cwb-8381, pub. **1955.** 36 p. 7 figs., tables. **Semi-annual Progress Report, 1954/1955,** on Contract Cwb-8523, pub. **1955.** 17 p. 4 figs., tables. (*See also* 9H–12, Aug. 1958, *MAB.*) **Semi-annual Progress Report, 1955/1956,** on Contract Cwb-8608, pub. **1956.** 45 p. figs., tables. **Semi-annual Progress Report, 1957/1958,** on Contract Cwb-9271, pub. 1958. 5 p. All typescript. **DWB**—In this series of reports, a variety of activities such as collecting and processing World Weather Records, objective forecast studies for the New England area, snowstorm studies, orographic effects on rainfall, vertical velocity computations from synoptic charts, radar storm detection, cyclogenesis, snow cover effects, etc. are described and many of the scientific results presented, along with data, charts, graphs, etc. *Subject Headings:* **1. Blue Hill Observatory activities 2. Objective forecast studies 3. Blue Hill, Mass. I. Conover, John II. Boucher, Roland J. III. Brooks, Charles F. IV. Wexler, R. V. Ashley, Richard E. VI. Putnins, Pauls H. VII. Brooks, Eleanor VIII. Conrad, Victor IX. Chang, Jen-hu X. Contract Cwb-9271.**—*M.R.*

9.10–3 551.585.7(234.3):06:551.5:063(44

International Congress on Alpine Meteorology, Chamonix, France, Sept. 17–19, 1956 **Communications présentées au IV^e Congrès.** [Papers presented at the 4th Congress.] *La Météorologie*, Paris, Ser. 4, No. 45/46:111–377, Jan./June **1957.** figs., tables, bibliogs. Also Rein, František, **Poznatky ze IV Mezinárodniho kongresu alpské meteorologie v Chamonix v září 1956.** [Information exchanged at the Fourth International Conference on Alpine Meteorology at Chamonix, in Sept. 1956.] *Meteorologické Zprávy*, Prague, 10(3):58–59, **1957** **DWB**—The 49 scientific papers presented at the 4th International Conference on Alpine Meteorology are published in this huge issue of **La Météorologie** under 4 major headings 1) General studies on alpine meteorology, 2) Precipitation studies, 3) Weather types, and 4) Radiation. Each article has an abstract or summary in 3 languages, namely, English, German and French, or Spanish. Most of the articles (30) are in French, 19 are in German. The volume was published with aid of the CNRS. Articles abstracted separately. (For listing of Contents, *see* p. 1281, Sept. 1957, *MAB.*) *Subject Heading:* **1. Alpine Meteorology Conference, 4th, 1956 Conferences.**—*M.R.*

9.10–4 551.501.45:551.521.3:551.593.1

*Penndorf, Rudolf and Goldberg, Bernice, **New tables of Mie scattering functions for spherical particles, Pt. 1, Values of amplitude functions a_m and b_m for refractive index $n=1.33$ and for size parameters $\alpha=0(0.1)30$.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 45, Pt. 1, March **1956.** 250 p. 4 refs., eqs. Almost entirely tables. Also their Pt. 2, **Values of amplitude functions a_m and b_m for refractive index $n=1.40$ and for size parameters $\alpha=0(0.1)30$.** *Ibid.*, No. 45, Pt. 2, March **1956.** 232 p. 4 refs. Almost entirely tables. Also Pt. 3, **Values of amplitude functions a_m and b_m for refractive index $n=1.44$ and for size parameters $\alpha=0(0.1)30$.** *Ibid.*, No. 45, Pt. 3, March **1956.** 251 p. 4 refs., eqs. Almost entirely tables. Also Pt. 4, **Values of amplitude functions a_m and b_m for refractive index $n=1.486$ and for size parameters $\alpha=0(0.1)30$.** *Ibid.*, No. 45, Pt. 4, March **1956.** 250 p. 4 refs., eqs. Almost entirely tables. Also Pt. 6, **Total Mie scattering coefficients for real refractive indices.** *Ibid.*, No. 45, Pt. 6, March **1956.** 98 p. figs., 49 refs., numerous tables. **DWB, DLC**—In Pts. 2, 3, and 4, tables are given for the real and imaginary parts of the complex amplitude functions a_m and b_m. They are the basic values for the computation of Mie scattering coefficients. The computations have been carried out with the IBM 701 electronic data processing machine. Pt. 6 is based on extensive computations of the total Mie scattering coefficient K using the IBM 701 Electronic Data Processing Machine. The detailed results show very clearly the nature and the complexity of the scattering function. K has been computed for size parameters $0\leq\alpha\leq30$ in steps of $\Delta\alpha=0.1$ and for 5 indices of refraction $n=1.33$, 1.40, 1.44, 1.486 and 1.50. The results are considered correct to 5 significant figures. To supplement the existing data, K has been computed for selected size parameters and for $n=1.0+\epsilon$, 2.00 and ∞ using a desk calculator. The accuracy for those results is four significant figures. The theory, the computations and the results have been extensively discussed. Included is also a list of all the tables and all the published reliable K values for real refractive indices. Finally, an empirical method is outlined for the computation of K for any α and any arbitrary n. The method is based on the existing data and one can compute using it the phase and amplitude values of a smoothed K function to about $\pm3\%$ or better. Based on this empirical method, K values are listed for selected refractive indices between $0.8\leq n\leq\infty$ and $0.2\leq\alpha\leq40$. In the latter article, a table and a graph are presented, showing total Mie scattering coefficients for refractive index 2.00, as a function of size parameter $2\pi r/\lambda$, where r=radius of particle and λ=wave length of incident light. *Subject Headings:* **1. Mie scattering coefficient 2. Scattering of light 3. Computation tables.**—*Authors' abstract and G.T.*

9.10–5 551.501.45:551.593.1:551.521.3

California. Univ. at Los Angeles, Dept. of Meteorology, **Additional scattering functions for spherical particles.** Contract AF 19(122)-239 (Investigation of Polarization of Sky Light), Scientific Report, No. 2, Sept. 1952. 21 p. tables, eqs. Also: Kerker, Milton and Perlee, Henry E., **Additional light scattering functions for spherical particles of refractive index of 2.** *Optical Society of America, Journal*, 43(1):49–50, Jan. **1953.** 2 figs., tables, 5 refs. Also:

Kerker, Milton and Cox, A. Lucille, **Eleven additional light scattering functions for spherical particles of refractive index 2.** *Ibid.*, 45(12):1080, Dec. **1955.** 2 tables, 11 refs. Also: Kerker, Milton, **Scattering functions for spherical particles of refractive index of 1.46.4.30i.** *Ibid.*, 45(12):1081–1083, Dec. **1955.** 2 tables, 12 refs. **DWB, DLC**—The first report states that the MIE-DEBYE theory of scattering on spherical particles can be extended for an incident light of an arbitrary state of polarization. The four Stokes parameters of the scattered light are then linear functions of the four Stokes parameters of the incident light. The matrix of the coefficients in this linear relationship involves four functions of the refractive index, the non-dimensional parameter α and the scattering angle γ. Two of these functions have been tabulated in the "Tables of Scattering Functions for Spherical Particles," *National Bureau of Standards, Applied Mathematics Series*, Vol. 4, **1949.** The other two functions, defined in the Introduction, were computed from some functions tabulated in the above-mentioned tables, and the result is given in following tables. With these four functions, the intensity, the degree of polarization, the position of the plane of polarization, and the ellipticity of the scattered light can be easily computed for a quite arbitrary polarization of the incident light. In the second paper, the authors declare that "The tables of scattering functions published by Lowen [*NBS, Applied Math Series*, 4] for index of refraction $m=2.00$, were not extensive enough to permit interpolation with the requisite degree of certainty." Additional functions have therefore been computed for better accuracy. Their numerical values are presented in tabular and graphical form. In the third article, light scattering functions, A_n and P_n, have been calculated for eleven values of $\alpha=2\pi\gamma/\lambda$ from $\alpha=3.3$ to $\alpha=12.5$ for spherical particles of refractive index, $m=2$. Intensity functions have been calculated for angle of observation, $\gamma=130$, for 23 values of α from $\alpha=1.3$ to $\alpha=12.5$. In the 4th article, Mie scattering functions for spherical particles of index refraction of $1.46-4.30\,i$ for 23 values of α from 0.4 to 5.0 are presented. *Subject Headings:* **1. Polarization 2. Computation tables 3. Scattering of light 4. Optical refractive index 5. Mie scattering coefficient.**—*Authors' abstracts and G.T.*

TEXTBOOKS AND SCIENTIFIC BOOKS

9.10–6 551.509.33(02)

*†Belinskiĭ, N. A., **Ispol'zovanie nekotorykh osobennosteĭ atmosfernykh protsessov dlia dolgosrochnykh prognozov.** [Application of certain features of atmospheric processes for long range forecasts.] Leningrad, Gidrometizdat, **1957.** 203 p. 67 figs., 27 tables, 77 refs., eqs. **DLC** (QC995.B39). Translation into English of p. 182–202 (incl. refs.) available at **DWB**—The Northern Hemisphere sea level charts for 1900–1939 have been tabulated and analyzed statistically in a number of ways to give objective tools for use in long range forecasting. The relations between surface pressure and solar activity, cyclonic and anticyclonic frequencies at different seasons in different areas, hemispheric air exchange, relation between pressure and air flow between Northern and Southern Hemispheres, long-period variations in intensity of cyclonic and anticyclonic activity, pressure relations to solar activity, Atlantic water temp. changes, water balance of N. Atlantic and Pacific, humidity over the oceans, precip. and evaporation over the oceans, dry and wet years, circulation anomalies and their causes, use of circulation indices and long-period atmos. circulation variations in long range forecasting of water supply in rivers, and a practical method of long range forecasting of cyclonic and anticyclonic activity for a year in advance are treated. The accuracy of methods can be determined from verification data or from the scatter diagrams or statistical graphs presented. *Subject Headings:* **1. Long range forecasting 2. General circulation anomalies.**—*M.R.*

9.10–7 551.508:621.315(02)

†*Dimaksian, Artashes Moiseeovich, **Novye teleizmeritel'nye gidrometeorologicheskie pribory.** [New telemetering hydrometeorological equipment.] Leningrad, Gidrometizdat, **1957.** 135 p. 49 figs., 29 tables, 46 refs., 60 eqs. **DWB** (M08 D582no)—A small technical book giving details of construction, calibration, installation, maintenance and recording of telemetering water (river) gages (UDB-1), distant recording mercury thermometers, aspiration psychrometers, anemometers and recording of electrical impulses on the basis of the most recent developments in telemetering. Methods of correction and computation based on an analysis of accuracy of recordings, both in the laboratory and in the field are treated. The

book contains numerous line drawings, nomograms and sample records, as well as theoretical background and illustrations of equipment. A good list of references is appended. *Subject Headings:* **1. Distant recording equipment 2. Telemetering river gage UDB-1 3. Telemetering psychrometers 4. Distant recording anemometers.**—*M.R.*

9.10–8 551.511(02)

Wehrlé, Philippe, **L'univers aléatoire.** [The random universe.] Pref. by Ferdinand Gonseth. Neuchâtel, Switzerland, Editions du Griffon, **1956.** 459 p. figs., 66 refs., eqs. *Bibliothèque Scientifique*, Vol. 29. **DWB.** Review by R. B. Lindsay in *Physics Today* 11(1):35, Jan. **1958.**—This sizeable and elegant volume is the result of a quarter of a century of statistical and philosophical study by the author and his colleague, GEORGES DEDEBANT. It consists of 5 books: 1) Value and need for a universal model, 2) Historical proof of a statistical universe, 3) The atmosphere, a source of the statistical concept of the universe, 4) Structure of the ultimate statistical universe, and 5) The actual dialectic processes. As can be seen a great deal of metaphysical and theoretical discussion will be found in the volume. However, Book III (p. 257–364) deals with many concrete aspects of the statistical processes in the atmosphere. It contains 4 chapters: 1) The uniqueness of the atmosphere as the only irreducible macrocosm; 2) State of theoretical meteorology before the evidence of the random nature of the atmosphere; 3) Dissipation of energy in the large natural fluid media, theoretical determination of the laws of rotation of the sun and the general circulation of the atmosphere; 4) The maximum probability of real states and general laws of physical evolution. The ideas of FERREL vs. those of HELMHOLTZ are discussed at some length. FERREL, owing to his empirical insight described a better model of atmospheric circulation than did HELMHOLTZ, who was a better theoretician. It is only when atmospheric processes are in a state of equilibrium that the classical laws of physics hold—and the atmosphere is seldom in equilibrium—hence all calculations must be based on probability. Of course the entire range of physical processes from the microcosm to the macrocosm (electrons to galaxies) is treated in an attempt to prove the dialectic model which is based, according to the author on realism, not on materialism or the like. EINSTEIN, HEGEL, MARX and BOHR come in for critical discussion and the word "Weltbild" appears 5 or 10 times on each of the 450-odd pages. The book makes interesting reading, and is based on a wide knowledge of dynamic meteorology, astrophysics and metaphysics. *Subject Headings:* **1. Cosmology 2. Statistical mechanics 3. Turbulent fluid motion 4. History of dynamic meteorology.**—*M.R.*

9.10–9 523.03(02)

†*Ambartsumian, Viktor A. (*ed.*), **Theoretical astrophysics.** Trans. from the Russian by J. B. Sykes. N. Y., Pergamon Press, **1958.** 645 p. 75 figs., 36 tables, 183 refs., numerous eqs. Index of names, p. 636–638 with variant transliterations of Russian names. **DLC** (QB461.A583)—Also: Ambartsumian, Viktor A. and Mustel', E. R. (*eds.*), **Theoretische Astrophysik.** Berlin, VEB Deutscher Verlag der Wissenschaften, **1957.** 644 p. 75 figs., 36 tables, 81 refs., numerous eqs. (*Hochschulbücher für Physik*, ed. by F. X. Eder and Robert Rompe, Vol. 27.) **DLC** (QB461.A585). Also: Ambartsumian, Viktor Amazaspovich (*ed.*), **Teoreticheskaia astrofizika.** [Theoretical astrophysics.] Moscow, Gosud. Izdat. Tekhniko-Teoreticheskoĭ Literatury, **1952.** 635 p. 75 figs., 36 tables, 81 refs., numerous eqs. **DLC** (QB461.A58)—The present English translation of the original (1952) Russian text has been revised and brought up to date by the authors. It is intended for graduate students of astrophysics and related disciplines. Pts. I, II and III (p. 1–399) by E. R. MUSTEL' deal with the theory of continuous spectra absorption lines in spectra of stars, and the physics of the sun (photo phase, granulation, convection, electrodynamics of the sun's atmosphere, sunspots and faculae, prominances, chromosphere, flocculi, flares, corona and radio emissions of the sun). Pts. IV through IX deal with: Planetary nebulae, novae, stars with bright spectral lines, the internal structure of stars, the scattering of light in planetary atmospheres, and interstellar matter, respectively. Chs. IV, V and VI are by V. V. SOBOLEV, Pt. VII by A. B. SEVERNYI, and Pts. VIII and IX by V. A. AMBARTSUMIAN. On p. 565–572 (Ch. 34) is a theoretical and empirical treatment of planetary atmospheres (especially their albedo) and absorption bands. A good bibliography, a table of constants and a subject index are appended. The Russian and German editions contain only 81 refs. mostly to Russian work up to 1954 whereas the English edition contains twice as many references to both native and foreign work through 1955

Subject Headings: **1. Astrophysics textbooks 2. Theoretical astrophysics 3. Solar physics. . Mustel', E. R. II. Severnyi, A. B. III. Sobolev, V. V. IV. Sykes, J. B.** (*trans.*).—*M.R.*

9.10–10 523.03(02)

*†Aller, Lawrence Hugh, **Gaseous nebulae.** N. Y., John Wiley, **1956.** 322 p. numerous igs., tables, bibliog. at end of most chapters, eqs. (*International Astrophysics Series*, Vol. 3.) **)LC** (QB855 A5)—Chapters of this new textbook cover: I. Types of gaseous nebulae, II. Meth-)ds of observation, III. Distances, dimensions and spectra of the gaseous nebulae, IV. Physical)roperties in gaseous nebulae, V. The forbidden lines, VI. Stars that illuminate the gaseous iebulae, VII. Structure and internal motions of the planetary nebulae, VIII. The diffuse aseous nebulae. *Subject Headings:* **1. Astrophysics textbooks 2. Nebulae 3. Planetary iebulae.**—*M.R*

9.10–11 532.5(02)

†Pai, Shih-I. (*Inst. for Fluid Dynamics and Applied Math., Univ. of Md.*), **Viscous flow heory, Vol. 1, Laminar flow.** Princeton, N. J., D. Van Nostrand Co., **1956.** 384 p. figs., ables, bibliog. at end of each ch., eqs. **DLC** (QA929.P3)—A modern textbook on fluid lynamics of viscous compressible fluids, treating of the Navier-Stokes equations, Reynolds aws of dimensional analysis, theory of very slow motion (small Reynolds number) boundary ayer equations, and their exact and approximate solutions for two-dimensional steady flow nd axially symmetrical and 3 dimensional boundary layer flow, unsteady flow and, finally, inearized theory of viscous compressible fluid. There is an author and subject index appended. The main use of the text would be for students of aerodynamics, but the applications to meteor-)logy are too numerous to be neglected. *Subject Headings:* **1. Hydrodynamics textbooks . Viscous laminar flow.**—*M.R.*

9.10–12 551.311.1(02) 551.311.1:016

†Shumskiĭ, P. A., **Osnovy strukturnogo ledovedeniia.** [Basic structural glaciology.] Moscow, Akademiia Nauk SSSR, **1955.** 491 p. 124 figs., 6 tables, bibliog. p. 468–477, eqs. **)LC** (QE576.S63)—This substantial textbook consists of 20 chapters divided among 3 major)arts: I. Mineralogy and crystallography of ice; II. Petrology of ice congelation, compaction nd metamorphic ice, and III. Geography of ice. Among the separate chapters are: structure,)hysical characteristics (temp., pressure, conductivity, freezing, sublimation, crystal growth n water and in atmosphere), composition, methods of research, various types of ice, changes nd cycles, various zones in glacial regions, etc. Firn, the chionosphere, frost, ablation, vater balance, thermal balance, albedo, hail, icing of objects, glacial movements, snow "dunes," astrugi, infiltration, river, sea and lake ice and blizzards, are among subjects discussed in heir logical places. Useful tables of data, nomograms, visual photographs of peculiar ice tructures are included. There are nearly 400 refs. in the bibliography on snow—over half o western literature. *Subject Headings:* **1. Glaciology textbooks 2. Ice structure 3. Ice ibliographies 4. Ice classification 5. Firn.**—*M.R.*

9.10–13 551.506.5(98):551.582(98)

†Laktionov, Aleksandr Fedorovich, **Severnyĭ polius: ocherk istorii puteshestviĭ k tsentru rktiki.** [The North Pole: Historical sketch of expeditions to the center of the Arctic.] Moscow, Morskoĭ Transport, **1955.** 471 p. figs., photos, tables, 61 refs. p. 471, Chrono-)gical list of expeditions. p. 466–470, Alphabetical list of ships participating in expeditions. **)LC.** p. 347–426 of this work translated by Kenneth H. Whiting, and issued as **Recent ioviet Scientific Investigations in the North Polar Regions,** by Documentary Research Div., Research Studies Institute, Air University, (Maxwell Air Force Base, Alabama), Dec. **1956.** 04 p. 25 figs., tables, 59 refs. **DWB** (919.8 L192re)—After a detailed introductory chapter n the numerous efforts to explore and chart the Arctic (with reproductions of many ancient naps), each major scientific expedition to the Arctic Ocean area is discussed in a separate hapter (arranged chronologically), starting with HENRY HUDSON (1607) and including the ecent Russian ("Severnyi Polius" 2–5) and American (T-3) drifting expeditions of 1945–1955 nd aerial reconnaissance flights over the Central Arctic. In a chapter on the results of cientific expeditions (p. 347–426), a long section on climate (p. 364–383) takes up the circula-ion patterns, temperature, wind, fog and precipitation, with a number of charts and graphs,

illustrating central Arctic conditions. Similar sections on magnetism, auroras, oceanography and ice. A subject, author and expedition index are appended. *Subject Headings:* **1. Arctic expeditions 2. Climate of Arctic Basin 3. History of Arctic expeditions 4. Arctic.**—*M.R.*

POPULAR METEOROLOGY

9.10–14 551.585:634.94:087.

Goetz, Delia, **Tropical rain forests.** Illus. by Louis Darling. N. Y., William Morrow, **1957.** 64 p. Price: $2.50. **DLC** (PZ10.G55tr)—A nicely illustrated childrens' book on the location, weather or climate, animals, natives, habits and resources of the tropical rain forests. *Subject Headings:* **1. Tropical rain forests 2. Juvenile science books.**—*M.R.*

9.10–15 551.506.5(261)

Evans, Frank, **The voyage of the Petula.** London, Robert Hale, Ltd., **1957.** 189 pp. photos. Price: 16 sh. **DLC** (QH11.E85). Review in *Weather*, London, 12(10):329, Oct. **1957.**—An account of the "Petula" (a marine biological) expedition across the Atlantic from Dakar to Barbados with ROLAND SHARMA as marine biologist and "DICK" as meteorologist and radio operator. The advantages of a small (50 ft) ship, which does not alter the marine environment as much as the conventional (large) ship does, are set forth. Program included study of sea and air temp., waves, fish, weather, etc. A small raft was towed behind the 50 ft yawl. This book is more concerned with the observational biological and nautical aspects than the scientific or meteorological results of the expedition. The illustrations show observations in the instrument shelter and sea-air-temp. readings. (*See also* 7.3–20, March 1956, *MAB.*) *Subject Headings:* **1. "Petula" Transatlantic Expedition, 1953–54 2. Oceanographic expeditions 3. North Atlantic.**—*M.R.*

9.10–16 551.582.1(794)

Aldrich, John H. and Meadows, Myra, **Southland weather handbook.** Los Angeles, The Weather Press, **1956.** 46 p. figs., tables. Price: $1.50. **DWB** (M82.1/794 A3653)—A non-technical brochure for natives and tourists providing information, regarding precise conditions in the various sections of southern California, including monthly charts of temperature and precipitation (for 78 stations) and tables of usual weather elements. In addition there are chapters containing information on smog, rain-making, atomic fallout, local forecast rules, highway and vacation weather services of the U. S. Weather Bureau, flying weather, comfort criteria, weather extremes in California and the U. S. and the World, summer and winter sports in S. California, effect of topography. *Subject Headings:* **1. Climate of Southern California 2. Recreational climatology.**—*M.R.*

9.10–17 551.582.1(68)

South African Tourist Corporation, **South Africa's wonderful climate.** Cape Town, Cape Times Ltd., **(1955?).** 40 p. illus., charts, photos (many in color).—An attractive illustrated tourist bulletin giving enough information about the resorts and recreation areas of South Africa to help the tourist decide on what to be prepared for in the different seasons. Temperature, rainfall, humidity and ocean temperatures, cloudiness, sunshine, fog, wind, thunderstorms, snow in mountains, etc. are described wherever pertinent with contrast and variability emphasized. Data for S. Africa in comparison with other resort areas or cities of the world, and charts, maps, etc., are included. *Subject Headings:* **1. Climate of South Africa 2. Tourist climatology 3. South Africa.**—*M.R.*

MONOGRAPHS AND COMPREHENSIVE PAPERS

See also: **Ice free airstrips, Brønlunds Fjord, Greenland** (Stoertz), 9.10–50; **Climate and marine fauna, Point Barrow, Alaska** (MacGinitie), 9.10–52; **German lightship obs., North Sea,** 9.10–88; **Climatic data, Australia** (Nuttonson), 9.10–96; **Shelter effects on microclimat.** (Jensen), 9.10–279.

9.10–18 551.583.

Arnold, Brigham A., **Late pleistocene and recent changes in land forms, climate, and archaeology in Central Baja, California.** *California. Univ. of California Publications in*

Geography, 10(4):201–318, **1957.** 8 figs., 16 plates, 8 maps. **DWB** (M83.3 A752L), **DLC**—In this thorough monographic study of the prehistoric, physiographic, or geomorphological development of the landscape of the Chapala Basin in central Lower California, there are 3 sections devoted to climate or climatic changes: 1) p. 204–205 where the rainfall regime, storms, surface winds, fog, temperatures and prevailing circulation are discussed; 2) p. 231–234 where climatic changes during Lake History as deduced from lime deposits, sand accumulation, and water balance are described and illustrated by a water economy graph, and 3) on p. 277–280 a chapter summarizing conclusions regarding climatic changes, coastal movements and the archaeological evidence contained in the monograph. It is concluded that there have been a series of marked climatic fluctuations resulting in the visible signs of (3) major fluctuations of 20–40 ft or more in lake levels. Heavier winter rainfall (20 to 30 in.) must have occurred during times when lake levels were high. *Subject Headings:* **1. Climatic changes in Baja California 2. Baja California.**—*M.R.*

9.10–19 551.578.71

†*Hull, Blanche B. (*Natick, Mass.*), **Hail size and distribution.** *U. S. Quartermaster Research and Engineering Center. Environmental Protection Research Division, Technical Report*, EP-83, Feb. **1957.** 89 p. 16 figs., 8 maps, 11 tables, 53 refs. **DWB**—The essential information and data on type, formation, occurrence, frequency, geographical distribution, size, damage and unusual reports of hail in all parts of the world is summarized in this valuable report and supported by tables of monthly frequency at 656 stations throughout the world, and by maps of the continental areas showing distribution of stations used. Small hail is most frequent on the West Coast in winter, but damaging hail (up to 5.4″ in diameter which is close to theoretical limit) is most frequent in the Plains States in summer and in the Plateau in late spring. Monthly charts and thunderstorm data for each year from 1940–49 are given for 25 U. S. stations with 125 hail days or more in 40 years of record. Great year to year variation is noted. Results of aircraft and thunderstorm network studies are also summarized and a good bibliography presented. *Subject Headings:* **1. Hail 2. Hail statistics 3. United States.**—*M.R.*

9.10–20 551.506.7:551.508.822(71)

*Canada. Meteorological Division, **Summaries of radiosonde observations in southern Canada, stations south of latitude 55°N, June 1941–Dec. 1949.** Toronto, (1956?) 149 p. almost entirely tables. **DWB** (M06.7/71 C212s)—This summary of radiosonde observations made during the period June 1941 to Nov. 1949 contains for each station average temperature, pressure and humidity at standard dynamic heights for each month of the record up to Dec. 1945; average temperature, dynamic heights and humidities at each standard pressure level for each month of the record from Jan. 1946; and temperatures, dynamic heights and humidities at standard pressures for each month averaged over the entire period of record. Humidity data are given of average mixing ratios and average relative humidities. The text portion of this report includes the instrumentation and method of observations, a detailed discussion of the presentation of the data and the accuracy and representatives of the data. The location of the stations is given, a table and also a map. *Subject Headings:* **1. Radiosonde observations 2. Southern Canada.**—*I.L.D.*

9.10–21 691.9:551.578.46

†*Voitkovskiĭ, K. F., **Raschet sooruzheniĭ iz l'da i snega.** [Design of buildings from ice and snow.] Moscow. Izdat. Akademiia Nauk SSSR, **1954.** 133 p. 32 figs., 16 tables, 57 refs., eqs. **DWB** (691.9 V898ra)—A large part of this monograph on construction of enclosures from ice or snow (usually as extensions of other types of structures) is devoted to data (in tables and schematic diagrams or graphs) on the conductivity, temperature, thermal balance, and other thermal properties of the ice and snow in, around and under such a structure under conditions at Moscow, Dnepopetrovsk and Sverdlovsk during different months of the year. Thawing characteristics, deformation data, rheological properties, ice columns, durability, etc. are all treated. *Subject Headings:* **1. Snow and ice constructions (buildings) 2. Thermal properties of snow houses 3. Permafrost temperatures 4. Moscow, U.S.S.R.**—*M.R.*

9.10–22 551.501.9:551.501.721:551.508.2

†*Bonnet, G., **Étude de la radiation solaire à Lwiro en 1953.** [Study of solar radiation at Lwiro in 1953.] *Belgium. Académie Royale des Sciences Coloniales. Classe des Sciences Naturelles et Médicales, Mémoires, New Ser.*, 6(6), **1958.** 77 p. 10 figs., 5 graphs, 5 photos, 18 tables, 19 refs. **DWB, DLC**—Description of the site of the observation center at Lwiro, Belg. Congo, where especially solar radiation measurements are conducted (direct, diffuse and global radiation), and the principal meteorological elements are observed. The author describes the instrumentation of the station and discusses in detail the methods of reduction, problems of testing and accuracy, and methods of calibration. Climatic data and observations of the usual 3 components of solar radiation are presented in numerous tables and extensive graphs. *Subject Headings:* **1. Meteorological stations 2. Actinometric stations 3. Solar radiation measurement 4. Solar radiation instruments 5. Lwiro, Belgian Congo.**—*A. V.*

9.10–23 551.577.38(94)

*Foley, J. C., **Droughts in Australia: review of records from earliest years of settlement to 1955.** *Australia. Bureau of Meteorology, Bulletin*, No. 43, **1957.** 281 p. 20 figs., tables, 55 refs. **DWB, DLC**—Duration, intensity and effects on production of droughts (i.e., periods of rainfall deficiency as shown by residual mass curves of monthly rainfall) in Australia are studied and an index of severity derived from spot diagrams showing duration and intensity of each. Seven major droughts have occurred in the past 100 years over most of Australia, and others have affected large areas (one or two states). The worst was 1895–1903. Many definitions of drought are cited, the one used in this study explained in terms of treatment of data, index of severity demonstrated, groups of stations in each state listed and shown on map, droughts in each section reviewed in brief and then in great detail by sections of states and by periods, and finally tabular data and graphical material (mass curves) appended. A subject index is included. *Subject Headings:* **1. Drought statistics 2. Historic droughts 3. Australia.**—*M. R.*

9.10–24 551.584.7(65)

*†Vageler, Paul (*Sao Paulo, Brazil*), **Zur Bodengeographie Algiers: Faktoren der Bodenbildung und -verteilung: die Catena als bodengenetische Einheit.** [The soil geography of Algiers: factors in soil formation and distribution: Catena as a genetic soil entity.] *Petermanns Geographische Mitteilungen, Ergänzungsheft*, No. 258, **1955.** 99 p. 25 figs. (incl. photos, some in color), table+3 tables (fold. in pocket), bibliographies throughout. **DWB**—The effect of climatic factors, on the soil types of Algeria, both in geologic past and in recent times, is discussed at length (p. 62–76) in the light of the author's theories, with numerous figures (climagrams, isohyetal charts, etc.) and references to literature cited. The seasonal rainfall patterns are clearly brought out and the stupidity of using annual rainfall in comparative climatic indices demonstrated. The monthly or seasonal variations in the Lang and the de Martonne rain factors are shown graphically in comparison with the mean annual value, for 8 stations in Algeria. Climate is also considered in subsequent sections on hydrology (p. 76–88), on wind and water erosion (p. 28–38), and on geology and relief (p. 39–62). It is shown that during the course of a year climatic types ranging from desert to humid and Arctic to tropical may occur at the same place. Sometimes the highest soil temperatures occur in winter when the leaves have fallen (70–75°C), whereas in summer only a temperature of 25–30°C would occur under the steppe vegetation. Three long folded tables in appendix give monthly and annual values of the Lang and the de Martonne rain factors; the Vageler chemical weathering index; and the hydrometeors (number of days of rain, total precipitation and mean temperatures) for each of about 50 important meteorological stations in Algiers. The author's chemical weathering index concept is explained in detail in the monograph, and is based on observations made by the author in Algeria on an expedition in 1942. *Subject Headings:* **1. Soil climate of Algeria 2. Climatic indexes 3. Vageler's chemical weathering index 4. Algeria.**—*M. R.*

9.10–25 551.579.4(794)

*California. Dept. of Public Works. Div. of Water Resources, **Floods of December 1955 in California.** Rev. ed. issued Jan. **1956.** Each section repaged. 23 plates (fold.),

ibles, photos. **DWB**—The record breaking California storm of Dec. 17–26, 1955, and resulting floods, flood flow, flood damage, flood control works and requirements for prevention of iture flood damage or disaster are fully treated with dozens of hydrographs, color charts, ibles, maps, etc. to give a preliminary idea of magnitudes involved in the various areas ffected. Separate chapters cover precipitation; Flood areas and damages; Flood flows and ontrol; Construction and maintenance of flood control projects; the California water plan by basin). Nearly 1,000,000 acres were flooded and 64 lives lost plus $400,000,000 property amage. Rainfall up to 35″ and showers of 2″/hr (not snowmelt) were responsible for floods. *ubject Headings:* **1. Floods, California (Dec. 1955) 2. Flood damage reports 3. California.** —*M.R.*

9.10–26 551.579.4(794)

California. Disaster Office, **The big flood, California, 1955.** Oct. **1956.** 126 p. numrous photos, map (fold.), 22 refs. Price: $1.56 from California Printing Div., Documents ection, Sacramento. **DWB**—A well printed verbal and pictorial account of the "greatest isaster of its kind in California's history," telling of the events leading up to the flood, the mergency in various sectors of California and the efforts at rehabilitation. The death toll as remarkably small (64 persons) and the property damage (of >$200 million) would have een far worse if preventative measures had not been taken during preceding years. There as just too much rain. *Subject Headings:* **1. Floods, California (Dec. 1955) 2. Disaster arnings 3. California.**—*M.R.*

9.10–27 551.577.37:551.579.5(758)

Pierce, L. B. and Tate, C. H., **Floods of April 1955 in Southwestern Alabama.** Montomery, Alabama, **1955.** 21 p. 5 figs., tables. At head of t-p: U. S. Dept. of the Interior, Geological Survey. **DWB**—Destructive flash floods occurred in the vicinity of Mobile, Alaama, on and after April 13, 1955, as a result of a deluge with 24 hr amounts ranging up to 20.33″ at axis) coming 3 days after a general rainfall of up to 6″ which fell on April 9–10 and soaked he ground. Detailed maps and isohyetal charts, rainfall amounts at 13 gages, river stages nd flow in several streams, flood damage information and other data are presented and nalyzed. Many records for rainfall amount were set. Of the 20.33″ (previous 24 hr record or Alabama was 20.00″ in 1929), 19.20 fell before 2 p.m. at Mobile Airport, 11.56″ fell in 4 ours, 19–20″ fell over considerable area. *Subject Headings:* **1. Record rainfall, Mobile, Ala. April, 1955) 2. Flash floods, S.W. Alabama (April 1955).**—*M.R.*

9.10–28 551.576.4

U. S. Air Weather Service, **Test of method for estimating the height of cirrostratus clouds (Appendix A to AWS TR 105-110, Memorandum on estimating the height of cirrostratus clouds).** Its *Technical Report*, 105-110 A, Jan. **1957.** 7 p. 5 tables. **DWB** (M066 V58a)—Statistical tests of estimates of heights of cirrus clouds during the various seasons and with various height intervals or temp. intervals show that the 90% contrail curve method gives as good or better results than "climatology" in winter or spring, and probably for "true" cirrus, but in summer and fall climatology gives better estimates. The trouble is that there is not enough good data for a climatology. The "lapse rate" method of estimation proposed by KREBS and DOEGE (*Met. Rund.*, 9:135–138, **1956**; *see* 7.11–250, Nov. 1956, *MAB*), seemingly gives good results but has not yet been tested statistically. *Subject Headings:* **1. Cirrus height estimation 2. Contrail curve method.**—*M.R.*

9.10–29 551.590.25:551.577

Mełzer, Hugo, **Meteor-astronomical universal laws of atmospherical precipitations.** *Urania*, Barcelona, 41(244):191–228, July/Dec. **1956.** 12 figs., tables (fold.), 33 refs. Also his: **First Supplement: Quasi-conics of the meteor dust streams of the Geminids, Ursids and Quadrantids.** *Ibid.*, 42(245):117–118, Jan./June, **1957.** And **Second Supplement: Detailed explanation for practical guidance in drawing quasi-conics.** *Ibid.*, p 118–123. 3 charts fold.). **DWB, DLC**—(Brief note on the article in *RMSQJ*, 83(357):389, July **1957.**) Daily rainfall data for periods up to 119 years for Brazil, Mexico (and other Latin American countries) are analyzed to test E. G. BOWEN's theory of correlation between days of maximum rainfall

and meteor showers 30 days earlier. These data are compared with those for the U. S., Japan, Great Britain, South Africa, Australia and New Zealand. A graphical analysis by what the author calls "Quasi-conics" is used to fortify the hypothesis. Further research (e.g., during IGY) might verify the method for use in forecasting. *Subject Headings:* **1. Bowen's meteor dust theory 2. Rainfall variability 3. Quasi-conics 4. Brazil 5. Mexico.**—*M.R.*

MANUALS, ATLASES AND HANDBOOKS

See also: **Instrument manuals** (U. S. Bureau of Ships), 9.10–90.

9.10–30 551.507.3:551.509.317(02)

Angell, James K., **Application of routine transosonde data to analysis and forecasting.** *U. S. Weather Bureau, Training Paper*, No. 13, April **1957.** 33 p. 7 figs., 6 refs., 34 eqs. **DWB** (M01.1 U587tr)—A short manual giving technical details necessary for evaluating and using transosonde (constant level balloon) data in practical analysis and forecasting. Examples are given of spectacular flights over the N. Pacific and Western North America and one (300 mb) flight going from Japan to San Diego (via Alaska and Alberta) and thence across the U. S. to New England and the Azores (120 hrs). It is stated that before long 3 or 4 transosondes will be operating at any given time over the Pacific or Atlantic sectors. Velocity and velocity error, geostrophic wind field and vertical velocity estimation from constant level balloons, and comparison of transosonde with conventional upper air data, constitute the main portion of the work. *Subject Headings:* **1. Transosonde data utilization manuals 2. Constant level balloon data 3. Weather forecasting.**—*M.R.*

9.10–31 551.509.311

O'Connor, James F., **Practical methods of weather analysis and prognoses.** *U. S. Office of Naval Operations, NAVAER*, 50-IP-502, Nov. **1952.** (i.e., 1955). 193 p. 127 figs., tables, chart (fold.). **DLC** (QC995.U665)—An attempt is made to present the methods of analysis including prognostic analysis which have been used successfully at Navy and other Analysis Centers. The methods described are applicable to analysis and forecasting in the middle latitudes. The contents are as follows: (1) Surface analysis covering the routines associated with the preparation and the analysis of the surface weather map, discussions of the plotted surface weather report, isobaric analysis, analysis of pressure centers, frontal analysis, frontogenesis and frontolysis, instability line, ridge and troughs, etc.; (2) Upper air analysis including the reliability and possible errors of upper-air data, mechanics of processing upper air charts, RAOB sounding analysis, preparation of frontal contour charts, properties of constant pressure charts, use of maximum potential temperature charts, techniques of contour, isotherm and differential analysis, checking of upper air reports, relation between upper temperature fields and frontal analysis, and the characteristics and interrelationships between the polar front, troposphere, jet stream and temperature fields aloft; and prognostic analysis including mechanisms associated with pressure (height) changes, use of pressure change charts, thickness charts, long wave considerations, types of pressure systems, and the forecasting procedures. The appendix contains **Instructions for use of geostrophic gradient wind scale** by H. B. Wobus; **Constant absolute vorticity trajectory tables** and **Estimation of 700-mb and 500-mb heights from sea-level charts** by W. P. Duthie. *Subject Headings:* **1. Synoptic analysis 2. Upper air analysis.**—*I.L.D.*

9.10–32 91(47,57/58) 551.582(02)(47,57/58)

Lialikov, Nikolaĭ Iv.; Kabo, R. M.; Davydov, E. M. and Voskresenskiĭ, S. S., **Geografiia SSSR: posobie dlia uchiteleĭ.** [Geography of the U.S.S.R.: manual for instructors.] Ed. by N. I. Lialikov and N. A. Solntsev. Moscow, Gosud-noe Uchebno-Pedagogicheskoe Izdatvo Ministerstva Prosveshcheniia RSFSR, **1955.** 536 p. numerous maps. **DWB** (914.7 L693g)—Pt. I takes up various geographic factors for the entire Soviet Union—topography, geomorphology, seas, climate, hydrology, soils, vegetation, population, etc. Pt. II takes up various geographic or political regions of the U.S.S.R. The section on climate (p. 33–45) comprises a resumé of climatic controls, Arctic, temperate, subtropical and mountain climates, with broad isothermal charts (Jan. and July) and a permafrost chart. Under each regional

eading is found a paragraph on the climate of that specific area. *Subject Headings:* **1. Geography of U.S.S.R. 2. Climate of U.S.S.R. 3. Geographical climatology 4. U.S.S.R.**—*M.R.*

9.10–33 551.576.1

U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, **Atlas oblakov.** [Cloud atlas.] Leningrad, Gidrometeoizdat, **1957.** 2 pts., laid in folder. (Pt. 1), Text. 65 p. figs., chart (fold.). Pt. 2), 131 photos (some in color). **DLC** (QC921.R87). Reviews by V. M. Skliarou and N. I. Novozhilov in *Meteorologiia i Gidrologiia*, Leningrad, No. 3:59–64, March **1958.**—A new and original cloud atlas and instruction manual consisting of 131 large and (many colored) cloud photographs made in the Soviet Union—emphasizing the unusual forms found in mountains, over the sea or observed from airplanes. Special forms such as condensation trails from aircraft, waterspouts, dust and sand storms or squalls, fog, rotor clouds, banner clouds, etc. are included. The text discusses the classification and recording of clouds, cloud systems, development of clouds, local indication of weather from clouds, special forms of clouds over mountain and sea and a glossary of Latin names with Russian equivalents. Also, a chart for cloud identification is folded in. *Subject Headings:* **1. Cloud atlases 2. Cloud observation manuals 3. U.S.S.R.**—*M.R.*

9.10–34 551.576.1

South Africa. Weather Bureau, **Cloud atlas.** Its *W.B.*, No. 11, (pub. **1950?**). unpaged. illus. (incl. photos). T-p and text in English and Afrikaans. **DLC** (QC851.S83)—Standard abridged cloud atlas for observers and forecasters in S. Africa. *Subject Headings:* **1. Cloud atlases 2. Afrikaans language.**—*M.R.*

9.10–35 551.582.3(73)

National Academy of Sciences. Committee on a National Atlas of the United States, **Map standardization for a loose-leaf national atlas.** Wash., D. C., National Academy of Sciences, National Research Council, **1955.** 5 p.—Specifications for and description of the national atlas, which will include loose-leaf climatic charts, are set forth in detail as regards format, scale, numbering, text, index, etc. *Subject Headings:* **1. Climatic atlases 2. United States.**—*M.R.*

9.10–36 551.576.1:912

International Commission for the Study of Clouds, **Skrajšani mednarodni atlas oblakov in mednarodni ključ oblakov.** [International atlas of clouds and of types of skies.] Ed. by Janko Pučnik. Ljubljana, Uprava Hidromet. Sluzbe LR Slovenije, **1952.** 66 p. figs., 41 plates (part col. in pocket), 5 refs. **DLC** (QC921.I538)—An abridged form of the **International Cloud Atlas,** with text in Slovenian and an introduction by PUČNIK giving brief history of cloud atlas down to the Washington Conference of 1947. *Subject Headings:* **1. Cloud atlases 2. Slovenian language 3. Translations. I. Pučnik, Janko** (*ed.*).—*M.R.*

GENERAL GEOPHYSICS AND METEOROLOGY

IGY

9.10–37 551.506.22:551.594.5

About amateur observations of the aurora during the International Geophysical Year. *Scientific American*, N. Y., 196(1):144–156, Jan. **1957.** 8 figs. (incl. photos), table. **DWB, DLC.** Also: **Mostly about making a cloud reveal the paths of nuclear particles.** *Ibid.*, 194(4):156–166, April **1956.** 5 figs. (incl. photos). **DWB, DLC**—Notes on ways in which amateurs may assist in the worldwide IGY program during 1957–8, especially in observing or photographing low latitude auroras, or in tracking the satellite. Another useful project would be to scan local records, newspapers, etc. for accounts of remarkable auroras of the past, for not half of the data on such occurrences are in the files of the auroral research centers. The second article describes an easy method of making a diffusion cloud chamber which will reveal vapor trails formed by nuclear particles or even cosmic rays. Method was described in this

department in Sept. 1952. Since then 6000 amateur scientists have made these chambers. An expansion chamber (not requiring dry ice) is also described and is similar to the original and highly precise Wilson chamber which was the only one Wilson ever made. Ratio of volume in chamber before and after expansion must be between 1.25 and 1.38, preferably 1.33–1.36. *Subject Headings:* **1. Auroral observations 2. IGY auroral program 3. Amateur satellite observers 4. Amateur auroral observers 5. Diffusion chambers 6. Wilson cloud chamber.**—*M.R.*

9.10–38 551.506.22

[*U. S. Navy Dept.*] **Antarctica the last frontier: the annual report of the Officer in Charge, U. S. Antarctic Programs, Fiscal year 1956.** Wash., D. C., U. S. Govt. Print. Office, **1957.** 12 p. port. of R. E. Byrd, map (fold. in color). **DWB** (919.9 U585an 1955/56)—After a tribute to Admiral Richard E. Byrd, who died March 11, 1957, the various expeditions to Antarctica before and after World War II, the U. S. IGY program for 1957–58 in the Antarctic, organizational and financial support, the role of Admiral Byrd as Officer in Charge and activities of other countries are reviewed, and future plans for a permanent Antarctic Unit are outlined. A large map of Antarctica shows various territorial claims and explorations to date. *Subject Headings:* **1. IGY Antarctic program 2. U. S. Antarctic expeditions. I. U. S. Antarctic Programs II. Byrd, Richard E.**—*M.R.*

9.10–39 551.5:550.3:061.3

International Geophysical Year, 1957–58: plans for the meteorological program. *World Meteorological Organization, WMO Bulletin*, 5(4):135–138, Oct. **1956. DWB**—Report on plans for standard forms, microcards, list of selected stations for IGY, Antarctic codes, Arctic Conference in Stockholm (May 22–25, 1956) Antarctic conference in Paris, (July 30–Aug. 3, 1956), the 4th session of CSAGI at Barcelona on Sept. 10–15, 1956, all 3 represented by J. Van Mieghem and V. Sundaram for WMO. Resolutions dealt with telecommunications, special stations on Greenland Ice Cap, weather ships and on islands in Arctic and Antarctic, actinometric work and world days. *Subject Headings:* **1. IGY program 2. WMO participation in IGY. I. Van Mieghem, J.**—*M.R.*

9.10–40 550.3:061.3

Kaplan, Joseph (*U. S. Natl. Comm. for the IGY, Nat. Acad. of Sci., Wash., D. C.*), **The International Geophysical Year.** *New York Academy of Sciences, Transactions*, Ser. 2, 19(4): 379–388, Feb. **1957. DLC**—A running account of the general IGY program (a list of the 55 participating countries), the program in each discipline and especially the satellite program. *Subject Headings:* **1. IGY program 2. IGY satellite program.**—*M.R.*

9.10–41 550.3:061.3

Popov, L. I., **Regional'noe soveshchanie po provedenniiu mezhdunarodnogo geofizicheskogo goda.** [Regional meeting on the conduct of the IGY.] *Meteorologiia i Gidrologiia*, No. 12:62–63, Dec. **1956. DWB, DLC**—A report on the proceedings of the regional conference on preparation for the IGY held at Moscow in Aug. 1955. The participants were Bulgaria, Hungary, the German Democratic Republic, Communist China, Mongolian People's Republic, Poland, Romania, the U.S.S.R., Czechoslovakia and Yugoslavia. The scope of IGY activity to be undertaken by the several countries is summarized briefly. *Subject Headings:* **1. IGY program 2. Russian participation in IGY.**—*I.L.D.*

9.10–42 551.501.9:551.590:551.506.22

Shapley, Alan H., **Solar activity, world days and communications.** *Ciencia*, Mexico City, 16(11/12):286–289, **1956. DWB**—The IGY Solar Activity Program including 24-hour observations for solar flares and radio noise outbursts, 6-hourly observations of sunspots and slowly varying components, special studies of unusual solar activity at a number of observatories in the Western Hemisphere, immediate reporting and coordinating of data, and eventual publication of all IGY solar data are reported. Regular world days (RWD) alerts and special world intervals (SWI) are also mentioned. *Subject Headings:* **1. Solar activity observation networks 2. IGY solar activity program.**—*M.R.*

9.10–43 550.3:061.3 551.507.362.2

[Williams, Trevor I.], **The start of the International Geophysical Year.** *Endeavour*, London, 16(63):123–124, July **1957. DWB, DLC**—A general discussion of the history, program, aims and some of the details of the IGY satellite program. *Subject Headings:* **1. IGY satellite program 2. IGY program.**—*M.R.*

9.10–44 551.582.3:550.3

Wilson, Jack, **The Look Geophysical Atlas: the world in space.** *Look*, N. Y., 21(1):37–43, Jan. 8, **1957.** illus. **DLC**—Several views of a large, elegant, colored 6′ globe, serving as a model of the earth as it would look from space, with no atmosphere and with exaggerated heights of mountains are presented, along with an article about the IGY program, the satellite, the nature of the Antarctic, and the meteorological (air mass-jet stream) and astrophysical problems that may be partially solved by knowledge gained during IGY. Several smaller sections of the earth (e.g., Antarctic with bases, stations and flags of countries occupying them) are shown in enlarged form, and also in color. *Subject Headings:* **1. Geophysical atlases 2. IGY program 3. Antarctic.**—*M.R.*

9.10–45 550.3:061.3

Maldonado-Koerdell, M., **La Conferencia Regional del Hemisferio Occidental para el Año Geofísico Internacional, Rio de Janeiro, 16 a 20 de julio de 1956.** [Regional Conference of the Western Hemisphere for the International Geophysical Year, Rio de Janeiro, July 16–20, 1956.] *Ciencia*, Mexico City, 16(11/12):257–264, **1956. DWB**—The objectives of the conference in IGY attended by 3 representatives from CSAGI, 3 from the Pan American Institute of Geography and History, 1 from CPAGI, 12 from Argentina, 15 from Brazil, 7 from Bolivia, 1 from Canada, 2 from Colombia, 5 from Chile, 2 from Peru and 1 from Venezuela, are outlined and the opening addresses by E. O. Hulburt, Sydney Chapman and other given in Spanish and English. *Subject Heading:* **1. IGY regional conferences.**—*M.R.*

WMO—IUGG

See also: **Obit. of H. I. Anda, Norway,** 9.10–81; **Obit. of F. X. R. de Souza, Brazil,** 9.10–82.

9.10–46 551.5:061.3

Activities of regional associations. *World Meteorological Organization, WMO Bulletin*, 5(4):145–147, Oct. **1956. DWB**—Regional Association I is to meet at Las Palmas, Canary Islands, Jan. 21, 1957 to discuss network, climatic atlases, hydrometeorological observations and exchange, IGY program, etc. Fourth Session of East Caribbean Hurricane Commission held in Ciudad Trujillo, Dominican Republic April 25–27, 1956, under W. A. Grinsted. Joint WMO/ICAO meeting on telecommunications in Europe is to meet in June, 1957. *Subject Headings:* **1. WMO. Regional Association meetings 2. IGY program.**—*M.R.*

9.10–47 551.585.9(213)

Humid tropics research: preparatory meeting of specialists. *World Meteorological Organization, WMO Bulletin*, 5(3):114–116, July **1956.** photo. **DWB**—A few of the problems discussed at the Kandy, Ceylon, meeting of specialists in Humid Tropics Research, March 22–24, 1956, and recommendations of that UNESCO sponsored meeting, are reviewed in the light of report by S. N. Naqvi, Director of the Pakistan Met. Department, who represented WMO at this session. Coordination of climatic and ecological studies, the need for climatic maps and consideration of improving solar radiation, rainfall and evaporation networks, dendro-chronological studies, soil climate, bioclimatic, tropical forecasting, jet stream, hurricane and thunderstorm warnings are treated. *Subject Headings:* **1. Humid tropics research 2. UNESCO-Advisory Committee on Humid Tropics Research 3. Kandy, Ceylon. I. Naqvi, S. N.**—*M.R.*

9.10–48 551.58(09)

Bartnicki, L. and Kühn, L., **Drogi rozwoju klimatologii.** [Lines of development of climatology.] *Przeglad Meteorologiczny i Hydrologiczny*, Warsaw, 7(3/4):173–181, **1954.**

DLC, DWB—A theoretical discussion of the future lines of development of climatology, a branch of science that has been somewhat neglected in recent years. The discussion is based on the author's interpretation of deliberations that took place at the first session of the Climatological Commission of the International Meteorological Organization, and were published recently in the **Bulletin of the OMM** and are based on speeches and articles by THORNTHWAITE and A. H. GORDON. The paper concludes with a report on the proceedings of the session. *Subject Heading:* **1. Progress in climatology.**—*A.M.P.*

9.10–49 550.3:061.3

International Union on Geodesy and Geophysics. Association of Meteorology, Rome, Sept. 1954, **Procès-verbaux; Actes de l'Association.** Its *Publication A.I.M.*, No. 10/b, publ. London, Oct. **1955.** 82 p. In French and English. **DWB** (M06 I611g, Met. 1954)—Transactions of the scientific sessions and the business meetings of the Association of Meteorology held in Rome, Sept. 14–23, 1954, financial report for 1951–3, activities of the various joint commissions and working groups of interest to meteorology (19 appendices), and officers of the Union and the Association are presented in French or English in this report. Besides the work of the Committees on upper atmosphere, atmospheric electricity, IGY, WMO, radio meteorology, arid zone, solar-terrestrial phenomena, precip., etc., the work of the Ozone Commission is given in some detail (p. 55–61) for the years 1951–54. The Ozone Commission suffered from the death of F. W. P. GÖTZ. G. M. B. DOBSON was elected President and SIR CHARLES NORMAND, Secretary. The association owns five ozone spectrophotometers loaned to stations in Spitsbergen, the Azores, Arosa, Aarhus and Westmorland. A new ultra-violet spectroscope will be sent to Kabul. In addition, 5 are located in Britain, 3 in Italy and one each in Norway, Sweden, Belgium, France and Iceland. Six are in N. America, 3 in India, 1 in Pakistan and 1 in New Zealand. One will be set up in Antarctica, 3 in Australia and 1 in Japan. Surveys in Europe, future program (esp. in IGY), finances and present and projected network of stations are covered in the report. *Subject Headings:* **1. IUGG. Association of Meteorology reports 2. International Ozone Commission 3. Ozone networks.**—*M.R.*

ARCTIC RESEARCH

See also: **History of Arctic expeditions** (Laktionov), 9.10–13.

9.10–50 551.582.2:629.13(988)

*Stoertz, George E. (*U. S. Geol. Survey*) and Needleman, Stanley M. (*U. S. Air Force Cambridge Res. Center*), **Investigation of ice-free sites for aircraft landings in Northern and Eastern Greenland and results of test landing of C-124 at Brønlunds Fjord, North Greenland.** U. S. Air Force Air Research and Dev. Command, Air Force Cambridge Research Center, Geophysics Research Directorate, Oct. **1957.** 40 p. 5 figs., 12 photos, 12 refs. At head of t-p: Report on Operation Groundhog, North Greenland, **1957. DWB** (629.136 S872r)—Geological and topographical aspects of this ice-free area of extreme N. Greenland are discussed and illustrated. Meteorological observations made Aug. 2, 1948 to Aug. 12, 1950 at a station located on the S. shore of Brønlunds Fjord, 6 mi W. of the emergency airstrip are summarized in considerable detail. For the 2 years the absolute maximum temp. was 64°F, and the observed minimum −45°F. Annual precipitation totaled 2.3″ and snow occurred on 56 days. Mean wind speed was 11 mph, maximum 65. Gales occurred on 50% of all days, and gusts as high as 74 mph occur. Pressure is high throughout year (1012–1015 mb or higher as a rule). There were 130 clear days, 120 cloudy days and 21 foggy days a year. Cloudiness is small compared with Thule and Nord; thus it is a favorable place for emergency landings when Thule and Nord are closed in for long periods. Evaporation increases the aridity. Soils were investigated by AFCRC to determine suitability for landing and were found adequate for the heaviest cargo planes after a minimum of construction work. *Subject Headings:* **1. Ice free airstrips 2. Climatic data for Brønlunds Fjord 3. Brønlunds Fjord, N. Greenland.**—*M.R.*

9.10–51 551.521.32

Church, Phil Edwards, **Micrometeorological problems important to Alaska and vicinity.** *Alaskan Science Conference, 2nd, Mt. McKinley National Park, Sept.* 4–8, 1951, *Proceedings*, pub. [**1953?**]. p. 283–287. 5 refs. **DWB**—One of the most important problems in Alaskan

Micrometeorology is the determination of the amount of solar radiation which is absorbed by the earth's surface, and this depends on unavailable measurements of reflected radiation (albedo) as well as incoming solar radiation which is now being recorded at Fairbanks and Bethel (and at Aklavik and Edmonton in Canada). Outgoing long radiation data are not available either, though both reflected and long wave radiation can be estimated from sporadic measurements made in lower latitudes. Heat balance is important to calculations of instability, convection and diffusion of gases, water vapor, insects (mosquitoes) etc. *Subject Headings:* **1. Arctic micrometeorology 2. Radiation balance 3. Alaska.**—*M.R.*

9.10–52 551.582.1(798) 551.46:592

†MacGinitie, G. E. (*Kerckhoff Marine Lab., Calif. Inst. of Tech.*), **Distribution and ecology of the marine invertebrates of Point Barrow, Alaska.** *Smithsonian Miscellaneous Collections*, Wash., D. C., 128(9), Nov. 30, **1955.** 201 p. figs., 8 plates, 11 tables, bibliog. p. 194–201. **DWB, DLC**—This monograph includes a description of the climate at Point Barrow, Alaska based upon U. S. W. B. statistics, a detailed account of ice conditions, a discussion of ocean currents in the vicinity of Point Barrow, a summary of ocean temperatures and salinity and a discussion of light conditions, and of tides, winds and storms. The collection of the marine fauna, its ecology and biology are described. Lists of all the species collected are given. *Subject Headings:* **1. Climate of Point Barrow, Alaska 2. Oceanographic observations 3. Marine fauna 4. Point Barrow, Alaska.**—*I.L.D.*

9.10–53 551.575

Hutchison, Dale H. (*Stanford Research Inst.*), **Preliminary survey of ice fog in the Alaskan area.** Stanford Research Institute, Contract AF 19(122)-634, Final Report, Nov. 1, **1951.** 17 p. 8 figs., 6 tables, bibliog. p. 36–37. **DWB**—Ice fogs with low visibility—a serious factor in polar aviation—are caused mainly by human activity. The conditions necessary are: temperature −30°F or lower, wind speed 3 mph or less and an adequate supply of water vapor in the air. Maximal occurrence in the morning hours. The frequency of ice fogs increases rapidly with decreasing temperature and reaches 70–80% at −50°F. An artificial dissipation of supercooled fog and ice fog by means of silver iodide was tried out without definite results. Abstracts of U. S. A.F. reports dealing with ice fogs are given. *Subject Headings:* **1. Ice fog 2. Visibility 3. Silver iodide fog dissipation 4. Alaska. I. Stanford Research Institute, Stanford, California II. Contract AF 19(122)-634 III. Wood, Charles P.**—*A.A.*

9.10–54 551.589

*MacFarlane, M. A., **The Wadsworth orthogonal polynomial technique over the North Polar Area during 1955.** McGill Univ. Arctic Meteorology Research Group, Contract AF 19(604)-1141, Supplement No. 1 to Scientific Report No. 3, Oct. **1957.** (4 p.) 9 figs., 5 tables, 4 refs. (For abstract on Scientific Report No. 3, *see* 8.10–27, Oct. 1957, *MAB.*) **DWB** (919 M145s)—Scientific Report No. 3 under Contract No. AF 19(604)-1141 set out two methods for the specification of the north polar pressure field in terms of numerical parameters. The report did not, however, discuss the performance of either system in actual practice. This present supplement to Scientific Report No. 3 analyzes the performance of the Wadsworth orthogonal polynomial method over the Group's standard 13×13 grid area during 1955. A later supplement will do likewise for the Godson orthogonal harmonic method. The efficiency and usefulness of the Wadsworth technique is by now ancient history. This brief paper does not seek to offer yet another proof of this well-known fact; the objective here is to demonstrate the degree of confidence with which one can use the Group's 1955 parameters in actual application. On the whole, the Wadsworth system seems to work even better in polar than in mid-latitudes, in spite of the absence of any strong zonal flow. The barded and printed parameters will be made available to any other interested group. *Subject Headings:* **1. Arctic synoptic climatology 2. Synoptic analysis 3. Pressure field specifications . Wadsworth orthogonal polynomial technique 5. Arctic.**—*Author's abstract.*

9.10–55 551.311.184(268)

Zavatti, Silvio, **Le "Isole di Ghiaccio" del Mare Artico e le stazioni scientifiche alla deriva.** [The Ice Islands of the Arctic Sea and the scientific drifting stations.] *Società Geografica Italiana, Bollettino, Ser. 8*, 9(9/10):444–452, Sept./Oct. **1956.** 2 figs., 7 refs. Eng. summary p. 452. **DWB, DLC**—The author briefly relates the story of the discovery of the

≪ice islands≫, made by Russian, American and Canadian explorers; then he deals with their origin, which scholars agree to attribute to the great land-glaciers of the Isle of Ellesmere without excluding the possibility of their deriving from the ice-shelf, stretching along the northern coast of the isle itself. Then the author deals with the proceedings of the five Soviet drifting stations which were established one after the other on the Arctic ice from 1937 to the present time, and of the North American ones, which J. FLETCHER started in 1952. The author concludes by affirming the existence of a remarkable current between 75°N and the North Pole, and relating that ancient explorers were deceived by ≪islands≫, which they believed to be portions of the dry land. *Subject Headings:* **1. Ice islands 2. Drifting ice stations 3. Arctic.**—*Author's abstract.*

ANTARCTIC RESEARCH

9.10–56 551.524.36(99)

*Flowers, E. J. (*Chief Meteorologist, Amundsen-Scott IGY Station*), **World record low temperature, South Pole, May 11, 1957.** *Monthly Weather Review*, Wash., D. C., 85(6):207, June **1957.** 2 tables. **DWB, DLC**—A temperature of −100.4°F at S. Pole on May 11, 1957 is world's lowest recorded surface temperature. It occurred during an extremely cold 3-day spell. Data for 12-hour intervals May 9–11, 1957 (pressure, wind direction and speed, snow surface temperature and air temperature) at 2, 5, and 10 m above ground are presented in a table. Snow surface temperature was usually 1°–6°F colder than the 2 m temperature, which in turn was 1°–8°F colder than at 10 m. *Subject Headings:* **1. Record low temperatures 2. South Pole temperatures 3. Antarctica.**—*M.R.*

9.10–57 551.506.5(99)

Sullivan, Walter, **With the trail blazers in Antarctica.** *New York Times Magazine*, Section 6, p. 10–11, 31–32, Dec. 30, **1956.** 4 photos. **DLC**—A popular article describing vividly the experiences of the men who blazed a trail across the 632 mi of shelf ice, crevassed glaciers and continental glaciers to help install the Byrd Station in the center of Marie Byrd Land. The crevasse detector used on the power machinery, precautions taken to avoid breaking-through the thin snow cover on the crevasses, filling crevasses, picking a trail by helicopter, dynamiting to find hidden crevasses, etc., are among the methods described. One man was killed when a tractor broke through. *Subject Headings:* **1. Antarctic expeditions 2. Byrd Station, Marie Byrd Land.**—*M.R.*

9.10–58 551.506.5:639.245.1(99)

Solianik, A. N., **"Slava" v Antarktike.** [The "Slava" in the Antarctic.] Moscow, Profizdat, **1954.** 126 p. illus. (some col.). **DLC**—An account of the Soviet whaling ship "Slava" which proceeds annually to the Antarctic. This is primarily a literary description of the voyage from Odessa, the hunting of whales in the southern Atlantic and in the Antarctic Ocean. Brief descriptions of weather and sea conditions are included. *Subject Headings:* **1. Whaling expeditions 2. Antarctic expeditions 3. Weather conditions 4. Antarctica.**—*I.L.D.*

9.10–59 551.506.5(99)

Shvede, Evgeniĭ Evgenievich, **Otkrytie Antarktidy russkimi moreplavateliami.** [Antarctic discoveries of Russian navigators.] Moscow, Izdat. Znanie, **1952.** 28 p. map, refs. **DLC**—An account of the Russian voyages to the Antarctic in the early 19th century, especially that of BELLINGSHAUZEN and LAZAREV in 1819–1821. Scientific results of several expeditions are reviewed, with meteorological results obtained by SIMONOV (an astronomer) in 1825. A chart shows route of BELLINGSHAUZEN and LAZAREV in 1819–21. *Subject Headings:* **1. Antarctic expeditions 2. Bellingshauzen Expedition, 1819–21 3. Antarctica.**—*M.R.*

OBSERVATORIES—SERVICES

See also: **Progress reports, Blue Hill Obs., 9.10–2.**

9.10–60 550.389

Johnston, H. Freeborn (*U. S. Natl. Bureau of Standards, Wash., D. C.*), **List of geomagnetic observatories and Thesaurus of values.** *Journal of Geophysical Research*, Wash.,

C., 61(2, Pt. 1):273–282, June 1956. 2 tables. **DLC**—The observers-in-charge at world-de geomagnetic observatories have been assiduous in supplying annual values of declination D), horizontal intensity (*H*), and vertical intensity (*Z*). The values are either final or eliminary, or additive to, or revisions of those previously published in this journal. Data r 1955 have even been kindly forwarded. *Subject Headings:* **1. Geomagnetic observatories Geomagnetic data.**—*Author's abstract.*

9.10–61 551.501.9(744)

Mountaintop weather men. *Sunday Star Magazine*, Wash., D. C., Nov. 27, 1955. p. 22. notos. **DLC**—Life for weather observers on top of Mt. Washington, N. H., is described and lustrated. It is rugged, but not as harsh as in past years for an 8-hour hike through snow is placed by a 2-hour snow caterpillar trip which brings mail and supplies, and a food supply r a year is stored in 5 freezers. Each man stays 20 days on the mountain and then has a)-day rest outside. *Subject Headings:* **1. Mountain observatories 2. Mount Washington bservatory 3. Mt. Washington, N. H.**—*M.R.*

9.10–62 550.38

Sucksdorff, E. (*Finnish Met. Off.*), **Magnetic Observatory Nurmijärvi.** *Geophysica*, elsinki, 5(1):48, **1952.** **DWB**—An account of new observatory built in 1951 by the Central leteorological Office, Helsinki, 40 km NNW of Helsinki on the southern shore of Lake Sääks-rve where artificial disturbances are at a minimum. Recording began in April 1952. Two ouses—a "variation" house and an "absolute" house and their equipment—are discussed. *ubject Headings:* **1. Magnetic observatories 2. Nurmijärva Observatory, Finland.**—*M.R.*

9.10–63 551.5:061

Labský, V., **Meteorologická a hydrologická služba v Německé demokratické republice.** Meteorological and hydrological service of East Germany.] *Meteorologické Zprávy*, Prague, (2):46–48, **1957.** 2 photos. Russian summary p. 46. **DWB**—In connection with a visit Czechoslovak meteorologists and hydrologists, the organization and activities of the East erman Meteorological and Hydrological Service are described. Under the Department of ne Interior the Service is headed by an appointed director with an advisory committee of ine members, which convenes at least every three months. The Service is divided into dministrative (general administration, personnel, accounting and education) and technical esearch, climatology, hydrology, synoptic) departments. The principal fields of research ctivity are dynamics of the atmosphere, the ionosphere, weather forecasting, agricultural eteorology, bioclimatology, hydrometeorology and instrument construction. The publica-ion program of the Service comprises periodicals for meteorology and applied meteorology, eteorological and hydrological yearbooks, bibliographies, etc. *Subject Headings:* **1. East erman Meteorological and Hydrological Service 2. East Germany.**—*G.T.*

9.10–64 551.5:061.1(51)

Béll, Béla, **Látogatás a pekingi Meteorológiai Intézetben.** [A visit to the Peking Me-orological Institute.] *Időjárás*, Budapest, 61(1):61–64, Jan./Feb. **1957.** 4 figs. **DLC**—he author visited the Meteorological Institute at Peking and gives a good insight into the ctivities and accomplishments of Chinese meteorologists. We learn that the first part of the limatic Atlas of China was published in 1953 (the second part is in press). A. Lu published study on the climatic regions of China. The number of climatological stations has increased om a few hundred to over 1200 in five years; the analysis center at the Institute is equipped ith statistical equipment. An aerological network was developed during the last decade nd will soon reach the required density of 200 km between radiosonde stations. Much is eing done to improve the accuracy of radiosondes (at the Meteorological Department of eking University and at the Meteorological Institute). At the Geophysical Institute of the cademy of Science, general circulation and numerical forecasting are the principal objects f study. The Geophysical Institute (which has a library containing 30,000 volumes) also onducts climatological and agrometeorological research. China actively participates in the GY program. The Meteorological Institute has a professional school (with 1800 students ttending at present) where meteorologists are trained in a 3-year program. The universities f Peking and Nanking offer 5-year curricula in meteorology. Photographs show the main

building of the Peking Meteorological Institute, its instrument yard, etc. *Subject Headings:* **1. Peking Meteorological Institute 2. Progress in meteorology 3. History of meteorological services 4. China.**—*G.T.*

9.10–65 551.5:629.13:0

Petrache, I., **Prietenil aviatorilor.** [Friends of aviators.] *Aripile Patriei*, Bucharest 1(10):18–19, Oct. **1955.** photos. **DLC**—Activities at Baneasa airport meteorological station are described in a vivid manner. The duties of observers, telegraph operators and other personnel (some of whom are referred to by name) are depicted in brief scenes including the briefing of a pilot. Pictures show the instrument platform, pilot balloon launching and radio operator at work. *Subject Headings:* **1. Aeronautical meteorological services 2. Baneasa Airport, Rumania.**—*G.T.*

9.10–66 551.5:061.1(497.1) 551.582(497.1

Petrovič, Št. and Vesecký, A., **Několik poznámek o Hydrometeorologické službě F.L.R. Jugoslavie a o podnebí Jugoslavie.** [A few notes on the Hydrometeorological Service of Yugoslavia and on the climate of Yugoslavia.] *Meteorologické Zprávy*, Prague, 9(5/6):152–153 **1956. DWB**—The authors who visited Yugoslavia during the 2nd meeting of the WMO Regional Association for Europe, briefly describe the history of the 100 yrs old service and discuss its present organization, activities and publications. Basic climatic values for Yugoslavia are also given. *Subject Headings:* **1. Meteorological services 2. Local climatology 3. Yugoslavia.**—*G.T.*

9.10–67 551.5

Thomson, Andrew (*Controller, Met. Service of Canada*), **An introduction (to the Canadian issue).** *Weatherwise*, Boston, 9(2):39 and 70, April **1956. DWB**—Brief comments on the relations and similarities between the U. S. Weather Bureau and the Canadian Meteorological Service with the expressed hope that greater intercourse would be effected between meteorologists and forecasters at the working level, between the two countries. *Subject Headings:* **1. International cooperation in meteorology 2. Canadian-U. S. relationships.**—*M.R.*

9.10–68 551.5:63:551.573:551.579.5

Uhlig, Siegfried, **Netzmässige agrarmeteorologische Beobachtungen.** [Agrometeorological network observations.] *Germany. Deutscher Wetterdienst, Mitteilungen*, 2(14):159–167, **1955.** 5 figs. **DWB**—Observations of agrometeorological values are carried out by the several climatological services. These include measurements of soil moisture, soil temperature, evaporation of soil moisture and of radiation. The station network for soil moisture measurement and the economic activities interested in such data (highway construction, agriculture and water economy), the technique of measuring soil moisture and the procedure for carrying out the measurements of the other elements are discussed. A map showing the locations of soil moisture observation in Western Germany, graphs showing the annual variation of soil moisture at a depth of 10–30 cm in percent of maximum obtainable soil moisture content for various localities, a map showing the location of Piche-evaporimeter stations, a diagram of its PICHE tube under a radiation shield and a graph showing mean monthly totals of potential evapotranspiration for stations in different climatic zones as measured by PENMAN, THORNTHWAITE and UHLIG are presented. *Subject Headings:* **1. Agrometeorological services 2. Soil moisture measurements 3. Potential evapotranspiration 4. Evaporation 5. West Germany.**—*I.L.D.*

9.10–69 551.5:061(437)

Vesecký, A., **Meteorology in Czechoslovakia.** *Weather*, 12(11):352–353, Nov. **1957.** photo. **DWB**—Observations in Prague began 1725 and continuously from 1775 under A. STRNAD, who set up 5 stations in Bohemia, increased to 700 after 1851. Between the wars a weather news and forecast service was developed, but destroyed by German occupation. Synoptic and aviation services were replaced soon after end of war. Agriculture and other work is described. *Subject Headings:* **1. Meteorological services 2. Czechoslovak Meteorological Service.**—*C.E.P.B.*

9.10–70 551.509.62:634:061

Young, F. D. (*U. S. W. B., L. A., Calif.*), **The Weather Bureau's Fruit-Frost Service in the Far West.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, Wash., D. C., 33(4):7, Jan. 23, **1956. DWB**—History of smudging (Pliny in A.D. 77) and of frost protection service in Calif. (1913) and in other Far Western States (1917) and savings which result from U. S. W. B. Fruit-Frost Service reviewed in brief article. The emergence of the idea that heating, not protection by smoke, is the important factor, is emphasized. *Subject Headings:* **1. Fruit-Frost Service 2. U. S. Weather Bureau 3. California.**—*M.R.*

SOCIETIES AND INSTITUTIONS

See also: **Peking Met. Inst., China** (Béli), 9.10–64.

9.10–71 551.5(058) 55(058) 551.594.5

†**Geophysical Research in Norway, 1950/1951.** Latest issue seen **1953/1954.** Printed at Bergen, John Grieg, 1955. Annual. Issued as *Norway. Geofysiske Kommisjon, Annual Report*, No. 1, July **1950**–June **1951**; No. 2, **1951/1952**; No. 3, **1952/1953**; No. 4, **1953/1954. DWB**—Each annual report summarizes the work in various branches of geophysics by 15 separate institutions or organizations and lists the 40 or 50 publications of these institutions for their scientists. Among the institutions doing auroral research are: the Institute for Theoretical Astrophysics of the Oslo Univ. (Carl Störmer), the Auroral Obs. at Tromsø (Vegard and Harang) and the Physical Institute of Oslo Univ. (Vegard and Kvifte). Meteorological research of the Norwegian Meteorological Institute (Hesselberg) and of the Geophysical Institute of Bergen Univ. (Mosby, Godske, Paulsen), the Norwegian Polar Institute (Sverdrup), the Oslo Univ. Institute for Theoretical Meteorology (Solberg) and the Institute for Weather and Climate Research of the Norwegian Academy of Science at Oslo is also cited with contributions already published and work in progress in many fields. *Subject Headings:* **1. Geophysical research 2. Meteorological research 3. Auroral research 4. Annual service reports 5. Bibliographies. I. Norway. Geofysiske Kommisjon.**—*M.R.*

9.10–72 061.1

Downs, Brian W., **The new constitution of the Scott Polar Research Institute.** *Polar Record*, 8(56):412–418, May **1957. DLC**—The new constitution was formally approved by Cambridge University on Feb. 23, 1957, and came into force as from Jan. 1, 1957. The report of the General Board is printed. The staff was 8 graduates and 3 assistants, expenditure £12,598, income £9356. It was recommended that the Institute be constituted a Sub-department of the Department of Geography. *Subject Heading:* **1. Scott Polar Research Institute.**—*C.E.P.B.*

9.10–73 551.5:061.2(748)

Meteorological activity in the Keystone State. *American Meteorological Society, Bulletin*, 37(7):362–363, Sept. **1956. DWB**—Report on history and activities of the Central Pennsylvania Branch of the American Meteorological Society which now meets monthly at Williamsport or Bloomsburg (organized in 1939 at State College and continuing with breaks to the present time). Because of the wide area represented by membership and meetings it was decided to limit the area for membership, and in Feb. 1952 the Penn. State Univ. Branch was formed at State College, and is restricted to Campus membership. Members continue to associate with the Central Penn. Branch. Two other branches, Pittsburgh and Scranton-Wilkes-Barre, are being formed. *Subject Heading:* **1. American Meteorological Society, Pennsylvania Branch.**—*M.R.*

9.10–74 551.5(064)

National Bureau of Standards shows scientific exhibits. *American Meteorological Society, Bulletin*, 37(4):169, April **1956. DWB, DLC**—The exhibitions in Jan. 1956 included an automatic hurricane weather station, an analog computer for instantaneous determination of radioactive fallout patterns and a freezing point oven for maintaining crystal oscillations at a very constant temperature. *Subject Heading:* **1. Meteorological exhibitions.**—*I.L.D.*

9.10–75 551.5:061.

Frankfurt a.M., Johann-Wolfgang-Goethe Universität. Meteorologisch-Geophysikalisches Institut, **Berichte des Meteorologisch-Geophysikalischen Institutes zu Frankfurt a.M. und seines Taunus-Observatoriums.** [Reports of the Meteorological-Geophysical Institute of Frankfurt and its Taunus Observatory.] No. 6, 1956, issued Frankfurt a.M., **1957.** figs., tables, refs. at end of each ch. Articles abstracted separately. **DWB**—A special collection of papers on various branches of geophysics presented in commemoration of the 50 years of meteorological research and activity of the Physical Society of Frankfurt Univ., and the 60th birthday of R. MÜGGE. For listing of contents, *see* p. 1138, Aug. 1957, *MAB*. All articles are abstracted separately. *Subject Headings:* **1. Frankfurt a.M. Meteorological-Geophysical Institute reports. I. Mügge, Ratje.**—*M.R.*

CONFERENCES

See also: **IGY regional conferences** (Maldonado-Koerdell), 9.10–45; **All-Union Conference on Snow Cover in Mountains** (Khmaladze), 9.10–255.

9.10–76 551.579:551.573

Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Commissie voor Hydrologisch Onderzoek, **Verslagen technische bijeenkomsten 7–10 en Verslag inzake het verdampingsonderzoek in de Rottegatspolder, 1947–1952.** [Proceedings of the Technical Meetings, 7–10, and Report on the evaporation research in the Rottegatspolder, 1947–1952.] 's-Gravenhage, **1955.** 299 p. figs., tables, eqs. English and French summaries p. 255–299. *Verslagen en Mededelingen*, No. 2. **DWB**—This publication contains the various technical papers presented at the Technical Meetings of the Committee of Hydrological Research, T.N.O. during the period 1950–1954 and also the Report of the Working Group for Evaporation Research on the results of its studies on the Rottegatspolder. Each of the articles is provided with an English and French summary. The papers are divided into five groups, namely: The study of precipitation data; model research on groundwater flow; measurements and improvements on the basis of small streams; geoelectrical research; and evaporation research in the Rottegatspolder (1947–1952). Articles of meteorological interest are abstracted separately. *Subject Headings:* **1. Hydrologic studies 2. Evaporation research 3. Netherlands.**—*I.L.D.*

9.10–77 551.5:061.6(265/6)

Spilhaus, Athelstan, **Report of the Standing Committee on Meteorology of the Pacific.** *Pacific Science Congress, 8th, Quezon City, Philippines, Nov. 1953, Proceedings*, Vol. IIA, pub. **1956.** p. 918–926. **DWB**—This report of the Standing Committee on Meteorology deals with its own activities and the research in the Pacific related to the programs and interests of the Pacific Science Association during the interval between the Seventh and Eighth Pacific Science Congresses. Various resolutions passed by the several Pacific Science Congresses from the first to the seventh, are stated and the degrees to which they were fulfilled are itemized. *Subject Headings:* **1. Pacific Science Association 2. Marine meteorology 3. Pacific Ocean.** —*I.L.D.*

EDUCATION, HISTORY AND BIBLIOGRAPHY

EDUCATION

9.10–78 551.5:378

Mispelblom-Beyer, H. A. D., **Malham Tarn 1955 een Weerkundige Vacantiecursus in Engeland.** [Malham Tarn, 1955: an English vacation course in meteorology.] *Hemel en Dampkring*, The Hague, 54(6):121–123, June **1956.** 2 photos. **DWB, DLC**—A description of the physical surroundings, the building and the equipment at Malham Tarn and of the daily activities of the academic and practical program in 1955. *Subject Headings:* **1. Meteorological curricula 2. Malham Tarn, Eng.**—*I.L.D.*

9.10–79 551.5:37

McIntyre, D. P. (*Asst. Cont., Res. and Training*), **Research and training in Canada.** *Weatherwise*, Boston, 9(2):49–50, April **1956. DWB**—Several aspects of education and research at a post graduate level are described: 1) advanced training at the Univ. of Toronto, Dept. of Physics, and at McGill Univ., Montreal, Dept. of Geography (F. K. HARE) and Cloud Physics Group (J. S. MARSHALL); 2) undergraduate courses at several other colleges; 3) in-service training and refresher courses; 4) research in air pollution (HEWSON), general circulation (HAURWITZ), air mass and contour analysis (PENNER, CROCKER and GODSON), radiation (GODSON), cloud physics and radar, Arctic meteorology, auroral physics (CURRIE), ozone (GOWAN), jet stream at high latitude (MCINTYRE), etc. IGY plans are also outlined. *Subject Headings:* **1. Meteorological education 2. Meteorological research 3. Canadian meteorological research 4. Canada.**—*M.R.*

HISTORY

See also: **History of Arctic expeditions** (Laktionov), 9.10–13.

9.10–80 551.5:8

Dufour, L., **Les écrivains et la météorologie: Théophile Gautier.** [Writers and meteorology: Théophile Gautier.] *Ciel et Terre*, Brussels, 73(9/10):436–438, Sept./Oct. **1957. DLC**—A note showing the completeness and the power of this French writer in describing meteorological phenomena. In his literary works THEOPHILE GAUTIER has created true meteorological pictures (aurora, mist, rain, dusk, etc.). *Subject Headings:* **1. Meteorology in literature Gautier, T.**—*A.V.*

BIOGRAPHY

9.10–81 551.5:92

[Obituary note on] H. I. Anda. *World Meteorological Organization, WMO Bulletin*, 7(4):158–159, Oct. **1957. DWB**—WMO technical assistant to Afghanistan—killed in air disaster at Copenhagen on Aug. 15, 1957. Native of Norway—age 51. *Subject Headings:* **1. Obituaries 2. Anda, H. I.**—*M.R.*

9.10–82 551.5:92

Obituary [of] Mr. F. X. R. de Souza. *World Meteorological Organization, WMO Bulletin*, 5(4):147–148, Oct. **1956.** Also obituary notice in *American Meteorological Society, Bulletin*, 37(10):563, Dec. **1956. DWB**—Dr. SOUZA died June 19, 1956 at Rio after a short illness. He was Director (since 1936) of Brazilian Met. Service and President, WMO Regional Association III and member of WMO Executive Committee and President of CCl 1946–51. Born 1891—educated at Polytechnical School at Rio up to 1917. Former President of Brazilian Oceanographical Institute. *Subject Headings:* **1. Obituary of Francisco Xavier Rodriguez de Souza 2. de Souza, F. X. R.**—*M.R.*

BIBLIOGRAPHY

See also: **Bibliog. on bird ecology** (Etchecoper, Hue), 9.10–287.

9.10–83 91:016

†Geographisch-Ethnologische Gesellschaft, Basel, **Bibliographie, 1955.** pub. **1956.** unpaged. Sections 7–16 (items 211–619).—This bibliography is a supplement to the "Korrespondenzblatt" of the Geographical Ethnologische Gesellschaft of Basel. It covers the field of geography and in some ways is similar to the bibliography published by the American Geographical Society. There are sections on climatology, hydrology, glaciology and water use. The total number of items listed in the overall bibliography is 619, some of which are annotated. A list of institutions with which the society exchanges publications is given. *Subject Heading:* **1. Geography bibliographies.**—*I.L.D.*

9.10–84 551.362:016

†U. S. Engineer School, Ft. Belvoir, Va. Library, **Guided missiles and rockets: a bibliography, 1946–1956.** issued Oct. **1956.** 50 p. **DWB** (016.623 U583gu)—References are

mostly to literature on guided missiles, but a number of references on research rockets and satellites are included in this unannotated bibliography of technical and popular literature. *Subject Heading:* **1. Guided missile bibliographies.**—*M.R.*

APPLIED METEOROLOGY

GLACIOLOGY

See also: **Glaciology textbooks** (Shumskiĭ), 9.10–12.

9.10–85 551.311.12:531.5

Thiel, E.; LaChapelle, E. and Behrendt, J., **The thickness of Lemon Creek Glacier, Alaska, as determined by gravity measurements.** *American Geophysical Union, Transactions*, 38(5):745–749, Oct. **1957.** 2 figs., 4 refs. **DWB, DLC**—The gravity method of geophysical exploration has been employed to determine the thickness of a valley glacier. One hundred and eighty-two gravity stations were established on Lemon Creek Glacier, Juneau Ice Field, Alaska. Using the appropriate ice-rock density differential, cross-sectional shapes of the glacier are computed to fit observed variations in the Bouguer anomaly on traverses across the glacier. Results are presented on cross section diagrams and on an isopach map. *Subject Headings:* **1. Glacier thickness 2. Gravity measurements 3. Lemon Creek Glacier, Alaska**—*Authors' abstract.*

9.10–86 551.311.1

Baird, P. D., **Method of nourishment of an ice cap in Baffin Island.** *I.U.G.G. Association of Scientific Hydrology, Brussels, 1951, Transactions*, v. 1:194–202, **1952.** graphs. **DWB**—The Barnes Ice Cap on Baffin Island, N.W.T., Canada, was investigated during the summer of 1950. This ice cap, some 6000 sq km in extent, appears to have an approximately balanced budget, and yet there is firn on its surface. It is postulated that its nourishment is by superimposed ice due to immediate freezing of much of the meltwater of summer. It is further inferred that a similar process nourishes many Arctic glaciers and ice caps where elevation, precipitation and temperature are all low. The name "Baffin Type" is proposed for these in the classification of glaciers. *Subject Headings:* **1. Glacier nourishment 2. Arctic expeditions 3. Barnes Ice Cap, Canada.**—*A.A.*

9.10–87 551.588.5:551.311.12(987

§*Orvig, Svenn, **The climate of the ablation period of the Barnes Ice-Cap in 1950.** *Geografiska Annaler*, 33(3/4):166–209, **1951.** 22 figs., 36 tables. **DLC**—Comprehensive meteorological observations were carried out every second hour from 0800 to 2200 daily, on the Barnes Ice Cap (Baffin Island) from June 1 to Aug. 26, 1950. The period covered is much too short for judging the climate of Barnes Ice Cap, considering the great variability of meteorological elements in this region. The mean temperature 3 ft above the surface was 33.4°F in July. The increase of temperature with height was .13°F/ft in the layer 3 to 23 ft. *Subject Headings:* **1. Glacial climate 2. Barnes Ice Cap, Arctic.**—*A.A.*

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Marine fauna, Point Barrow, Alaska** (MacGinitie), 9.10–52; **Satellite ship navigation** (Lawrence), 9.10–119.

9.10–88 551.506.1:627.92(261.2,261.3)

*Hamburg. Seewetteramt, **Meteorologische Beobachtungen von deutschen Feuerschiffen der Nord- und Ostsee, Bundesrepublik, 1954.** [Meteorological observations of the German lightships in the North and Baltic Seas, for the Federal Republic, 1954.] Its *Einzelveröffentlichungen*, No. 15, **1957.** 109 p. Mostly tables. **DWB** (551.46 G373e)—A standard publication of 3 hourly synoptic observation data and frequency tabulations of temp., wind, cloudiness, precip. amounts and days, pressure, air-sea temp. differences, etc. for months and

ar, and summaries for 1951 and 1952 for German lightships in North Sea and Baltic: "J/E3," Borkumriff," "Elbe Fehmarnbelt" (and for Elbe 2 and 3 for 1951 and 1952). A map shows cations of all these ships. For abstract on 1953 issue, *see* 9.1–87, Jan. 1958, *MAB*. *Subject eadings:* **1. Lightship observations 2. German lightships 3. Annual meteorological data mmaries 4. North Sea 5. Baltic.**—*M.R.*

9.10–89 550.37:537.21(261)

Stommel, H., **Exploratory measurements of electrical potential differences between dely spaced points in the North Atlantic Ocean.** *Archiv für Meteorologie, Geophysik und oklimatologie, Ser. A*, 7:292–304, **1954.** 2 figs., 6 tables, 4 refs. English, German and ench summaries p. 292. **DLC**—Theory suggests that potential differences of about 1 volt ll be produced across Atlantic by deep tidal currents. Measurements at ends of cables rks Is.-Bermuda-Halifax-Horta-Porthcurno and New York-Horta-St. Vincent are set out d discussed. The observed lunar semidiurnal component of potential difference Halifax-rks Is. and Horta-St. Vincent agrees with tidal theory, but on New York-Horta-Porthcurno e voltages are much less than those given by theory. *Subject Headings:* **1. Geoelectric easurements 2. North Atlantic.**—*C.E.P.B.*

9.10–90 551.508.4(02)

U. S. Bureau of Ships, **Manual for overhaul, repair and handling of marine mercurial arometers with parts catalog.** Contract NObs-47863 [Report], March **1953.** 83 p. 68 gs. **DWB**—A detailed manual with numerous illustrative diagrams. *Subject Headings:* **Instrument maintenance 2. Instrument manuals.**—*M.R.*

9.10–91 551.5:656.61

World Meteorological Organization, **International list of selected and supplementary ships.** rovisional ed., Feb. **1955.** each section repaged. Mimeo. Loose-leaf. **DWB** (387.2 9927i)—A list of >2300 selected and supplementary ships from >22 countries with types equipment (barometer, hygrometer, barograph), routes, methods of obtaining sea surface mp., etc. Special types of reporting ships are also listed in some cases. Under "ships of her countries" are listed 120 ships from a dozen countries (Panama, Mexico, Ecuador, etc.). he major groups are U. K. and U. S. (>600 each); Netherlands, 200; France, 150; Argentina, 6; Portugal, 75; Hong Kong and India, 60; Italy, 50; New Zealand and Canada, 33; and ustralia, Denmark, South Africa, Thailand, etc. <30 each. *Subject Headings:* **1. Marine eteorology 2. Merchant Marine observation ships 3. Merchant ship observation equip-ent.**—*M.R.*

AERONAUTICAL METEOROLOGY

See also: **Ice free airstrips, Brønlunds Fjord, Greenland** (Stoertz), 9.10–50; **Icing of aircraft** (Krimach), 9.10–234.

9.10–92 551.574.1:551.574.7:629.13

Brun, Rinaldo J., **Cloud-droplet ingestion in engine inlets with inlet velocity ratios of 0 and 0.7.** *U. S. National Advisory Committee for Aeronautics, Report* 1317, **1957.** 35 p. 5 figs., tables, 10 refs., 13 eqs. "Supersedes its *Technical Note*, No. 3593" (*see* 8.1–87, Jan. 957, *MAB*.) **DWB**—The paths of cloud droplets into two engine inlets have been calculated r a wide range of meteorological and flight conditions. The amount of water in droplet rm ingested by the inlets and the amount and distribution of water impinging on the inlet alls are obtained from these droplet-trajectory calculations. In both types of inlet, a prolate lipsoid of revolution represents either part or all of the forebody at the center of an annular let to an engine. The configurations can also represent a fuselage of an airplane with side m-scoop inlets. The studies were made at an angle of attack of 0°. The principal difference etween the two inlets studied is that the inlet-air velocity of one is 0.7 that of the other. The udies of the two velocity ratios lead to some important general concepts of water ingestion inlets. *Subject Headings:* **1. Icing of aircraft 2. Drop impingement on aero engines.**—*uthor's abstract.*

9.10–93 551.542:629.

Moll, Kendall D. (*Stanford Res. Inst., Menlo Park, Calif.*), **Computer solution of minimu flight paths.** *Navigation*, Los Angeles, 5(2):95–102, June **1956.** 2 figs., 17 refs. **DW DLC**—Use of wind data for computing minimum flight paths has been difficult and, as a ru too time-consuming to be practical—even by graphical methods. The IBM-701 at Suitlan has been used to shorten the time involved. A 3-dimensional solution is demonstrate advantages—mainly financial—are enumerated and the cost of $1000 a day (of the compute shown to be small compared with a possible saving of over $5 million a year for the 100 aircra flying the N. Atlantic—if each one saved only 15 min a.flight. *Subject Headings:* **1. Minimu flight path computers 2. Electronic computers.**—*M.R.*

ASTRONAUTICS—SATELLITE OBSERVATORIES

See: **Guided missiles bibliog.,** 9.10–84; **Satellite ship navigation** (Lawrence), 9.10–120.

AGRICULTURAL METEOROLOGY

See also: **Weather and plant diseases** (Miller), 9.10–288; **Wheat phenology** (Nuttonson), 9.10–289; *see also* 9.10–278 to –280.

9.10–94 551.584.42:551.524.3

Kaneseki, S. (*Naniwa Univ.*), **The microclimatological temperature relationships in th persimmon field.** *Journal of Agricultural Meteorology*, Tokyo, 10(1/2):33–36, Dec. 195 6 figs. In Japanese; English summary p. 36. **DWB**—Diurnal maximum and minimu temperature (air temperature at 200, 150, 100, 50, 10 cm heights and soil surface temperature at the inside and outside of the persimmon field were observed from April 1, 1952 tillMarch 3 1953. From Fig. 1–6, the distinctive microclimatological temperature relationships in th persimmon field are recognized. *Subject Headings:* **1. Persimmon field temperatures 2. Fiel microclimatology.**—*Author's abstract.*

9.10–95 551.524.2:6

Nishiuchi, H. (*Naniwa Univ.*), **Relation between the isothermal line of the mean a temperature of the coldest and the warmest month and the limit of the distribution of crop in the world.** *Journal of Agricultural Meteorology*, Tokyo, 10(1/2):61–62, Dec. **1954.** fig In Japanese; English summary p. 62. **DWB**—The isothermal lines of the mean air temperatur of the warmest and the coldest month are shown on the map in order to indicate the tem perature climate of the Northern and Southern Hemispheres and to collate with the limit of th distribution of some crops in the world. *Subject Headings:* **1. Temperature-crop distributio limits 2. Isothermal charts 3. Northern Hemisphere 4. Southern Hemisphere.**—*Author' abstract.*

9.10–96 551.585 551.551.582.2(93

*Nuttonson, Michael Y., **The physical environment and agriculture of Australia wit special reference to its winter rainfall regions and to climatic and latitudinal areas analogou to Israel.** A study based on official records, material, and reports of the Dept. of Agricultur of Western Australia, South Australia, Victoria, and New South Wales, and of the Common wealth of Australia. Sponsored by the Office of the Director of the Ministry of Agriculture o Israel. Wash., D. C., American Institute of Crop Ecology, **1958.** 1124 p. figs., tables Mimeo. **DWB** (M:63 N9887ph)—A colossal compilation of a tremendous amount of climatic phenological and crop data from Australia with climatic analogs for Israel in various parts o Australia—both year round, summer and winter. Vegetation, soils, shelterbelts, wate resources, water use, irrigation, economic development, food requirements, research program in agriculture at various centers, land use, wheat and sheep ranchers, insect pests and control use of aircraft in Australian agriculture; fruit, vegetable and sugar production, etc. etc. are covered in detail. Dozens of charts show temp., wind, rainfall, growing season, etc. fo Australia or parts of Australia. *Subject Headings:* **1. Climatic analogs 2. Phenology o Australia 3. Climatic data, Australia 4. Australia 5. Israel. I. Israel. Ministry o Agricultuer II. American Institute of Crop Ecology, Wash., D. C.**—*M.R.*

INDUSTRIAL METEOROLOGY

See also: **Heating of houses** (Akai), 9.10–281.

9.10–97 551.5:69

Crocker, C. R. and Tibbetts, D. C., **Winter construction.** *National Research Council Canada. Div. of Building Research, Better Building Bulletin*, No. 6, (1957?). 26 p. 2 refs. **DWB**—A small bulletin indicating some of the ways in which contractors or builders can keep n working even during the middle of the winter. Water supply, storage of materials, fire nger, excavating for foundations in frozen or partly frozen ground, mixing and pouring ncrete, laying masonry, plaster, stucco, roofing, painting, materials for winter, protection, ating and lighting problems are discussed with specific reference to ambient temperatures in anada. *Subject Heading:* **1. Winter construction.**—*M.R.*

9.10–98 551.510.42:66

Chemical industry and air and water pollution. *Nature*, London, 175(4462):790–792, lay 7, **1955. DWB**—Account of a symposium on "The prevention of atmospheric and water llution in the chemical industry" held in London, April 4–5, 1955. The first day was devoted o methods of disposal of effluents, the second to air pollution. Methods of washing out or herwise treating harmful gases, dust and soot in various industries were described. *Subject eadings:* **1. Atmospheric pollution 2. Chemical industries 3. Symposia.**—*C.E.P.B.*

9.10–99 551.5:06:629.13

Pan American World Airways. *American Meteorological Society, Bulletin*, 37(8):429–430, ct. **1956.** 2 photos. **DWB**—Pan American World Airways links 80 countries and has an aborate meteorological reporting, forecasting, and research organization. The reporting ations are gradually being taken over by local governments complying with ICAO directives, ut there are still 126 weather reporting stations operated by PAA in Latin America. Forecast nters are operating in Tokyo and Bangkok, and research on forecasting for current or future t operations is done in New York and San Francisco. Instruction in meteorology is carried ut at San Francisco headquarters. *Subject Headings:* **1. Airways meteorological services Pan American World Airways meteorological program.**—*M.R.*

9.10–100 551.510.42:551.551

Frankenberger, E., **Der Austauschkoeffizient über Land.** [Exchange coefficient over nd.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):170–176 **1958.** fig., 7 refs., eqs. English and French summaries p. 170. **DWB, DLC**—The methods to determine ie Austausch coefficient for the dispersion of smoke and factory gases are briefly described. he dependence of vertical Austausch coefficients on the temperature stratification is discussed ith the aid of observational results. It is shown that high heat conductivity and heat capacity the ground can prevent the appearance of dangerously low Austausch coefficients. *Subject eadings:* **1. Smoke diffusion 2. Austausch coefficient.**—*Author's abstract.*

9.10–101 551.5:620.92:539.1

Tait, G. W. C., **Reactor siting, the exclusion area concept and an alternative approach.** *tomic Energy of Canada, Ltd., AECL*, No. 388, Oct. **1956.** 32 p. 28 refs., 5 eqs. At head title: Chalk River Project, Research and Development. **DWB** (539.7 A881r), **DLC**—A eneral review of the meteorological factors which would determine the optimum "exclusion rea" around an atomic reactor site to guard against hazards to the population of surrounding reas in case of a disaster. A limited hazard must be tolerated in order to allow communities o take advantage of the industry. Sutton's equations are modified to aid in establishing the mits. Previous reports (MORLEY and FRY) underestimated (by > an order of magnitude) ie distance hazardous radiations would be carried. The author sets a value of 2 km² per Mw released, as a realistic conversion factor, and a design figure of 0.1 to 1.0 Mw as a limit on ffective release in built-up areas (1–10 Mw for unsettled country). Frequency of inversion adiabatic lapse conditions are important in evaluating hazard-distance factors. *Subject eadings:* **1. Reactor hazard 2. Radiation hazard range.**—*M.R.*

9.10–102 620.92:551.521

Mathur, K. N. and Khanna, M. L. (*both, Natl. Physical Lab. of India, New Delhi*), **Application of solar energy to small scale industries.** *Journal of Solar Energy Science and Engineering*, Phoenix, Ariz., 1(1):34–36, Jan. **1957.** 3 tables, 2 refs. **DWB, DLC**—The utilization of solar energy as a supplementary power source in village industries in India discussed. This involves the use of solar energy to raise water from earth for irrigation and domestic purposes, heat for cooking and power for cottage industries. The results of the evaporation of cane and palm juices under laboratory and field conditions with the aid of 9 i sq plane mirror (designed by GARDNER) are presented in a table. Field experiments showe an efficiency of 30%. The costs and prospects for increasing efficiency are considered. *Subject Headings:* **1. Solar energy utilization 2. India.**—*I.L.D.*

MEDICAL METEOROLOGY

9.10–103 551.586:621.275.1

Murty, K. S. (*Regional Lab., Visakhapatnam-2*), **Relation between R.B.C. count and altitude.** *Current Science*, Bangalore, 25(6):186–187, June **1956.** fig., 10 refs., 4 eqs. **DWB, DLC**—A plot of the log of the red-blood count (R.B.C.) against altitude in thousands of feet compared with an empirical curve due to BARCROFT (1925), shows that there is good agreement up to 10,000 to 15,000 ft, above which the actual count falls short of the theoretical, owing to the failure of the body to produce enough red blood cells to make up the oxygen tension deficiency. Symptoms of anoxia or mountain sickness result. Formulas are given for the oxygen dissociation of the blood, the relation of O_2 tension to atmospheric pressure, etc. *Subject Headings:* **1. Mountain sickness (anoxia) 2. Oxygen deficiency-haemoglobin relationships 3. Altitude effects on man.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Objective forecast studies, Blue Hill, Mass.,** 9.10–2; **Mie scattering and refractive index** (Penndorf, Goldberg), 9.10–4; **Computation tables, scattering of light** (Kerker et al.), 9.10–5; **Solar radiation meas., Belgian Congo** (Bonnet), 9.10–22; **IGY solar activity obs. networks** (Shapley), 9.10–42; **Mountain obs., Mt. Wash., N. H.,** 9.10–61.

9.10–104 551.501:551.579.

Basin, A. M., **Vychislenie deĭstvuiushcheĭ vodosbornoĭ ploshchadi.** [Calculating effective catchment areas.] *Meteorologiia i Gidrologiia*, No. 9:36–39, Sept. **1956.** fig., tables, 23 eqs. **DWB, DLC**—The problem of calculating the effective water catchment area involves determining within the entire area F_0 the maximum area Ω, the corresponding length $L_i = vt_c$, where L_i—length of water current within the boundaries of the effective surface t_c—period of water yield and v—velocity of longitudinal cause of the water. Hence Ω constitutes the area of maximum flow for given values of v and t_c. The author attempts to solve this problem for simplified assumptions of established flow processes by providing concepts of isochrones of the water collecting area, and by considering pear or leaf-shaped configurations of water collection basins. *Subject Heading:* **1. Effective catchment area calculations.**—*I.L.D.*

9.10–105 551.501:551.577(54)

*Majumdar, K. C. and Gangopadhyaya, M. (*both, Regional Met. Center, Calcutta*), **Representativeness of average rainfall from smaller number of stations over Damodar and Barakar catchments.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(2):199–208, April **1957.** fig., 2 tables, 9 refs., 6 eqs. **DWB, DLC**—Over the Damodar and Barakar catchments the weighted averages of rainfall calculated after Thiessen model is statistically found not to be significantly different from the simple arithmetic averages. The simple average calculated from a randomly chosen smaller number of stations is found to be statistically representative

the average rainfall calculated by using all stations. The confidence limits to the true ean have also been calculated. *Subject Headings:* **1. Representativeness of rainfall observations 2. Rainfall confidence limits 3. India.**—*Authors' abstract.*

9.10–106 551.501:551.515.3(766)

Montgomery, Floyd C. (*Weather Observer, Blackwell, Okla.*), **Some observations on the nado at Blackwell, Oklahoma, 25 May 1955.** *Weatherwise*, Boston, 9(3):97, June **1956.** is. **DWB**—Some odd thermal, acoustical and luminous phenomena observed during passage the famous Blackwell tornado are described and illustrated by a weather observer who was blocks west of the path of the tornado when it hit town at 9:27 p.m. The wind at the server's place was dead calm, the storm sounded louder than a fast freight train, a rotating e band with intense light was observed near the top of the funnel and a smell of burnt sulfur, gether with the clammy air, made breathing difficult. St. Elmo's fire was observed coming from the ground at the home of a victim (she was carried half a block by the storm). Air is hot (temperature went from 74°–80°F) and vegetation was wilted or scalded in places. *bject Headings:* **1. Tornado observation 2. Tornado, Blackwell, Okla. (1955) 3. Blackwell, kla.**—*M.R.*

9.10–107 551.501.4:551.521.1

Albrecht, F. H. W., **Solar radiation results—Darwin, 1953.** *Australia. Bureau of eteorology, Meteorological Study*, No. 9, June **1956.** 24 p. 11 figs., 10 tables, 10 refs., 7 eqs. **WB**—For calculating the amount of solar radiation or energy at any given place at any ven time of day or year, the average diurnal variation in solar radiation, at any season, can calculated from the tabulated values of the diurnal variation in turbidity factor. Hours of nshine, low cloud and cirrus cloud amount, solar distance and angle must be known. In this per the calibration constants and data for Linke's and Angström-Schüepp's turbidity factors and *B* for Darwin, Australia for 1953, where 450 series of observations were made in 2 ectral ranges, are tabulated and presented in graphical form. The water vapor factor was oroughly examined though no data from direct reading was possible. Of the 450 series, 57 ere taken with cirrus clouds covering the sun. The relation between the scattering exponent and the water vapor content W, and between B, α and T, the significance of α, and the onthly mean values of these quantities, as well as the diurnal variations are discussed and esented in tables and graphs. *Subject Headings:* **1. Solar radiation calculations 2. Turbidity ctor data 3. Darwin, Australia.**—*M.R.*

9.10–108 551.501.42:551.582.2(52)

*Saito, R., **On the homogeneity of records of phenomena.** *Journal of Meteorological esearch*, Tokyo, 8(10):613–622, Nov. **1956.** 8 tables. In Japanese; English summary p. 613. **WB, DLC**—The inhomogeneities of records of phenomena caused by the change of the ethod of observation is investigated. Sometimes, only the symbols of phenomena had been ven in the guide-book until afterwards detailed definitions of them were given. On other casions, definitions and/or symbols themselves were changed. These circumstances in pan are shown in the tables and the diagrams in this article. The phenomena whose homoneity have been ensured for a long period of time, being unaffected by such alterations, are ce-needles," "haze," "soft hail," "dew," "hoar-frost," "glaze," "thunder and lightning," c. Even when a definition of a phenomenon was unchanged, the method for enumerating mber of days of its occurrence might be changed on several occasions. For example, a lear day" was defined in 1940 as a day with mean daily amount of cloud less than 2.5, whereas, fore that time, it had been a day with mean daily amount of cloud less than 2. The phenomena, whose homogeneity regarding days of occurrence has been ensured for a relatively ng period, are "soft hail," "fog," "thunder and lightning," "hoar-frost," etc. As the method observation of phenomena is not affected by the change of meteorological instruments, e may expect that he can obtain homogeneous records of them. However, against exctation, we are not always able to have good homogeneous data of phenomena extending er a long period of time, as the result of frequent alterations of the method of observation. *bject Headings:* **1. Homogeneity 2. Climatic data 3. Japan.**—*Author's abstract.*

9.10–109 551.501.42:551.582.2(5

Saito, R., **On the homogeneity of observed values of precipitation and other elemen** *Journal of Meteorological Research*, Tokyo, 8(11):687–688, Dec. **1956.** 2 tables. In Japanes English summary p. 687. **DWB, DLC**—Elements whose homogeneities have not been d stroyed very much by the frequent changes of method of observation are listed in the table this article. Among them are precipitation, maximum temperature, minimum temperatur wind direction, depth of snow cover, duration of sunshine and amount of cloud. *Subj Heading:* **1. Homogeneity 2. Climatic data 3. Japan.**—*Author's abstract.*

9.10–110 551.501.6:551.578.

Kozik, E. M., **Nomogrammy dlia opredeleniia skorosti dvizheniia lavin.** [Nomogra for determining the velocity of avalanches.] (In: Akademiia Nauk Uzbekskoĭ SSR. Instit Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 26 275. 9 figs., 11 tables, 2 refs., 12 eqs.) **DLC**—The velocity of avalanches on different slop and the distance the avalanches are hurled are calculated by the formula of G. K. Tushinsk namely:

$$S = 2.3\,\frac{a}{k^2}\,lg\cdot\frac{a-kv_0}{a-kv} - \frac{v-v_0}{k},$$

where S—length of area (slope) over which avalanche moves; a—coefficient determined by t formula $a = 9.81\cos\alpha(tg\alpha - f)$ where α—angle of slope of a locality of the area, f—frictio coefficient of snow, k—coefficient depending upon the area of the avalanche; v_0—initial veloci of the avalanche and v—terminal velocity. By transforming the formula into the form

$$S = \frac{a}{k^2}\left(2.3\,lg\,\frac{1-\beta}{1-\gamma} - \gamma + \beta\right)$$

a nomogram can be constructed to solve this equation and avoid the difficulties involved selecting values for S, a, k and v_0. The construction of the nomogram is described in deta the nomogram is reproduced, and its use is illustrated. *Subject Headings:* **1. Nomogram 2. Avalanche velocities.**—*I.L.D.*

9.10–111 551.506.1(67

*Belgian Congo. Service Météorologique, **Annuaire Météorologique du Congo Belge et o Ruanda-Urundi, 1957.** [Meteorological annual of the Belgian Congo and of Ruanda-Urund 1957.] *Belgium. Académie Royale des Sciences Coloniales, Classe des Sciences Techniqu Mémoires in 8°, n.s.*, 6(4), **1957.** 167 p. numerous tables. **DWB**—The main part of th "almanac" consists of astronomical data for the Belgian Congo for 1957, but p. 147–167 a devoted to standard climatic data tables for 16 stations in the Belgian Congo (temperatur relative humidity, rainfall and pressure) for the year 1954 and hourly global and diffuse sol radiation for Léopoldville-Binza, Stanleyville and Elisabethville for 1955. *Subject Heading* **1. Annual meteorological data summaries 2. Solar radiation data 3. Belgian Congo. I. D Soleil, George** (*ed.*) **II. Vander Elst, N.**—*M.R.*

OBSERVATIONAL DATA

See also: **History of Arctic expeditions** (Laktionov), 9.10–13; **Petula trans-Atlantic exped.,** 1953–54, (Evans), 9.10–15; **Radiosonde obs., S. Canada,** 9.10–20; **IGY amateur auroral obs.,** 9.10–37; **IGY solar activity obs. networks** (Shapley), 9.10–42; **Antarctic expeds., Byrd Station** (Sullivan), 9.10–57; **Whaling expeds., Antarctica** (Solianik), 9.10–58; **Bellingshauzen exped., 1819–1821, Antarctica** (Shvede), 9.10–59; **German lightship obs., North Sea,** 9.10–88; **Constant level balloon data** (Gaalswyk), 9.10–115.

9.10–112 551.506.1(569.

*Lebanon. Service de Climatologie, **Bulletin Climatologique Mensuel** [Monthly clim tological bulletin], No. 2–4, Oct.–Dec. **1956.** 3 pieces, about 32 p. each. Mostly table In French and Arabic. Issued by the Observatoire de Ksara. **DWB**—Climatic data for 4 stations, daily rainfall data for 89 stations, and wind and cloud data (8, 13 and 18 h) or fr

ıencies for 12 stations in Lebanon (Damascus, Beirut and Tripoli are main cities) are pre-ınted in tables, with an isothermal and isohyetal chart for the month and a written (French) ımmary of weather conditions of the month in the area. *Subject Headings:* **1. Monthly matic data summaries 2. Lebanon. I. Beirut, Lebanon. Université St. Joseph. Ob-ırvatoire de Ksara.**—*M.R.*

9.10–113 551.506.8:551.524.36

Lindsey, Alton A., and Newman, James E. (*both, Purdue Univ., Lafayette, Ind.*), **Use of ficial weather data in spring time—temperature analysis of an Indiana phenological record.** *ology*, Durham, North Carolina, 37(4):812–823, Oct. 1956. 6 figs., 3 tables, 9 refs. **DWB, LC**—The record of spring flowering dates observed by C. P. DEAN in his arboretum and ırden at Bluffton over the period 1920–1952 were analyzed in connection with temperatures ıblished by U. S. W. B. at Bluffton. Fifty-one species were averaged and "for each year partures from normals in flowering date, daily mean temperature and spring temperatures ere compared." A new temperature summation method based upon the daily maximum and inimum temperatures and upon the assumption of a linear growth curve was developed to flect the approximate duration of different temperature levels during the diurnal regime. or each of 24 species heat sums obtained by the duration parameters formula for various esumptive thresholds and time periods were analyzed by punch-card machines for standard viations and coefficient of variations. Curves of these values usually revealed the threshold mperature for flowering (within 5°F) and the time period of spring pre-flowering activity ithin 10 days). From these values and the mean flowering dates the requisite heat sums r each plant was found. The range of meteorological temperature and threshold and growth riods are discussed. It is concluded that a rather close parallel exists between the official eteorological record and temperatures actually influencing the plant. *Subject Headings:* **Phenological temperature computations 2. Cumulative temperature 3. Bluffton, Ind.**—*ased on author's summary (I.L.D.)*

INSTRUMENT CARRIERS

See also: **Transosonde data utilization manuals** (Angell), 9.10–30; **IGY satellite program** (Williams), 9.10–43.

9.10–114 551.507.2:551.508.824

Automatic ocean-based weather station developed. *American Meteorological Society, ulletin*, 37(6):317, June 1956. photo. **DWB**—A floating meteorological station that can towed, anchored and left unattended for 6 mo. has been developed by the Natl. Bureau of andards and tested in Chesapeake Bay. It has a range of >800 mi. The float was designed the David Taylor Model Basin, is 20 ft long and 10 ft wide, made of aluminum and non-agnetic alloys and can be anchored in water 3600 ft deep if necessary. It sends out code oadcasts of air and water temp., pressure, wind direction and speed on a frequency of 6 egacycles. *Subject Headings:* **1. Automatic weather stations 2. Buoy weather stations Chesapeake Bay.**—*M.R.*

9.10–115 551.507.3:551.506.7

Gaalswyk, Arie, **Suggested uses of meteorological data collected by constant-pressure vel balloon systems.** General Mills, Inc. Mechanical Div., Contract AF 19(604)-2170, ientific Report, No. 1, Feb. 26, 1958. 32 p. 12 figs., 7 charts in pocket, 12 refs., eqs. **WB**—The purpose of this report is to present a "State of Art" on the operational use of eteorological data which can be gathered by a constant-pressure-level balloon (CPB) system. nstant-pressure-level balloons carrying meteorological sensing instruments are found to be eful for gathering meteorological data over remote areas with sparse radiosonde data cover-e. The radio direction finding tracking system employed provides position data to compute resentative winds for use in extending analysis of constant pressure charts. For areas th sufficient CPB data coverage it will be possible to construct other charts for which these ta are unique. Nomograms have been devised which permit processing wind data from the orted positions systematically and in rapid order. Working-size copies of these nomograms

are enclosed in an envelope at the rear of this report. *Subject Headings:* **1. Constant lev balloon data 2. Constant pressure charts 3. Nomograms.**—*Author's abstract.*

9.10–116 551.507.321.2 :551.507.362

Winzen, Otto C., **Plastic balloons in the rocket age.** *Missiles and Rockets*, Wash., D. C 2(3):50–52, March **1957.** photos. **DLC**—Various uses for large plastic balloons in upp air research, especially the launching of rockets from high altitudes (Rockoon system), are cite and illustrated and specifications for these balloons given. Scientific data obtained in th way are mentioned. The 2,000,000 cu ft balloon (WRI) can be used to launch satellites or track a satellite as it (the balloon) encircles the globe at heights up to 145,000 ft. A 5 millio cu ft plastic balloon could carry a research plane or glider to as high as 80,000 ft—much cheap than by using a booster or mother plane. *Subject Headings:* **1. High altitude balloon 2. Rockoons 3. Polyethylene balloons 4. World girdling balloons.**—*M.R.*

9.10–117 551.507.32

Wentworth Institute, Boston, Mass., **Final Report on its Contract AF 19(604)-758, Jun 20, 1956.** 17 p. 12 photos.—Under Contract No. AF 19(604)-758, services, materials, an facilities were provided in connection with the mechanical and electronic assembly of exper mental instrumentation and its adaptation to balloon systems for use in the balloon launchin program being conducted by the Atmospheric Devices Laboratory of the Air Force Cambrid Research Center. Balloon instrumentation systems, including the gondolas and their exper mental apparatus, as well as supporting equipment, power supplies, and associated cablin were assembled and modified in the fulfillment of the purpose and scope of this contrac *Subject Headings:* **1. Dirigible balloons 2. Balloon instrumentation 3. Balloon launchin I. Davin, M. J.**—*Author's abstract.*

9.10–118 551.507.362.1 :551.510.5

Chubb, T. A., Byram, E. T., Friedman, H. and Kupperian, J. E. (*U. S. Naval Res. Lab Wash., D. C.*), **The use of radiation absorption and luminescence in upper air density measur ments.** *Annales de Géophysique*, Paris, 14(1):109–116, Jan./March **1958.** 8 figs., 9 ref **DLC**—Principle of the method and results of rockets sounding effectuated in 1953 and 195 The experiments forming the basis of this paper involve the use of radiation and luminescen as a means of measuring upper air densities. *Subject Headings:* **1. Upper air density measur ments 2. Rocket sounding 3. Radiation absorption and luminescence.**—*A.V.*

9.10–119 551.507.362.1 :551.515

Haas, Herbert W.; Smith, Harold D. and Tatreault, L. E., **The design and performanc of the Mytymouse Homing System for the Rocket Photography of Hurricane Project.** Ne Mexico. College of Agriculture and Mechanic Arts. Physical Science Lab., Contract N9on 95302, (Unnumbered Report), Feb. 1, **1957.** 26 p. 22 figs. (incl. photos), 19 refs. **DW** (621.3843 N532d)—The objective of "The Rocket Photography of Hurricanes Project" is obtain high altitude photographs of vast weather formations. After the photographic pha of a mission is executed, the instrumented section of the rocket containing the cameras an two homing transmitters is lowered to the surface of the sea and recovered by the most e pedient means. One of the homing transmitters is a long range unit called SARAH. T second unit is a medium-to-short range homing transmitter called MYTYMOUSE. T design and performance of the MYTYMOUSE homing system for sea recovery operations presented in the report. *Subject Headings:* **1. MYTYMOUSE homing system 2. Hurrican rocket photography.**—*Authors' abstract.*

9.10–120 551.507.362.2 :629.19 :5

Lawrence, Lovell, Jr., **Navigation by satellites.** *Missiles and Rockets*, Wash., D. C 1(1):48–52, Oct. **1956.** 8 figs. **DLC**—Detailed review of a system for ship navigation b earth satellite fixes. *Subject Headings:* **1. Ship navigation by satellite 2. Satellite ship nav gation.**—*M.R.*

INSTRUMENTS

See also: **Distance recording equipment** (Dimaksian), 9.10–7; **Radiosonde obs., S. Canada,** 9.10–20; **Solar radiation meas., Belgian Congo** (Bonnet), 9.10–22; **Instrument manuals,** 9.10–90; **Buoy weather stations,** 9.10–114; **Radiation meas. with Bellani pyranometer** (Zingg), 9.10–191; **Piche evaporimeters for evap. determination** (Vinck), 9.10–224; **Cloud chamber studies of nuclei** (Sano et al.), 9.10–228; **Cloud chamber studies of nuclei** (Shimada et al.), 9.10–229.

9.10–121 551.508:681.2

Nosikov, G. F., **O kachestve priborov.** [The quality of instruments.] *Meteorologiia i drologiia*, Leningrad, No. 3:52, March **1956. DWB, DLC.** Trans. into English available r reference. **DWB** (M09 N897qu)—Various defects of meteorological instruments produced Soviet factories are pointed out. Thermometer scales are not properly fastened, the pillary tubes break frequently, etc., the convexity of meniscus of the barometer is too small, c. *Subject Heading:* **1. Instrument technology in U.S.S.R.**—*I.L.D.*

9.10–122 552.508.29:537.311 551.508.25:537.311

Albrecht, Hans J., **Transistors as thermometers and bolometers.** *Geofisica Pura e pplicata*, Rome, 37:191–196, **1957.** 6 figs., 7 refs., 4 eqs. German and English summaries 191. **DLC**—Details of the author's work during 1956/57 in Melbourne in the design and pplication function of transistors for tele-thermometric and bolometric work (e.g., air-sea mp., solar, global radiation and radiation balance investigations). Results of sensitivity sts for thermometer and bolometric combinations are given. Conclusion is that the response me of 1–2 min. is considerable; but the small size, low power requirement, stability and liability make them potentially useful for meteorological and geophysical purposes. *Subject eadings:* **1. Transistor thermometers 2. Transistor bolometers 3. Transistor sensitivity.** *M.R.*

9.10–123 551.508.29:621.317

Kastrov, V. G. and Faraponova, G. P., **Radiatsionnye oshibki platinovogo termometra protivleniia.** [Radiation errors of the platinum resistance thermometer.] *Moscow. entral'naia Aerologicheskaia Observatoriia, Trudy*, No. 16:18–20, **1956.** 2 refs., 2 eqs., fig. **LC**—It is shown that the error of platinum resistance thermometers is not only due to direct ating of the wires by the sun but also by overheating of parts of the mounting. Equations e presented for calculating the radiational heating of the wires (without including the effect the mounting) and overheating relative to air temperature resulting from the flow of heat om the antennae. The consideration of these sources of error and the construction of atinum resistance thermometers are discussed. *Subject Headings:* **1. Platinum resistance ermometers 2. Radiation error of resistance thermometers.**—*I.L.D.*

9.10–124 551.508.54

Deacon, E. L. and Samuel, D. R., **A linear, temperature compensated hot-wire anemom-er.** *Journal of Scientific Instruments*, London, 34(1):24–26, Jan. **1957.** 3 figs., table, 2 refs., eqs. **DLC**—A hot-wire anemometer is described which gives a linear output over the range wind speed 1 to 16 m/s and is therefore well suited to studies of atmospheric turbulence. It also provided with temperature compensation so that the effects of air temperature fluctua-ons (both rapid and slow) are eliminated. These desiderata are achieved with little increase complexity over the simple hot-wire circuit. *Subject Heading:* **1. Hot wire anemometers.** *Authors' abstract.*

9.10–125 551.508.71

Magee, J. B. and Crain, C. M. (*both, Electrical Eng. Res. Lab., Univ. of Texas*), **Recording icrowave hygrometer.** *Review of Scientific Instruments*, Lancaster, Pa., 29(1):51–54, Jan. **58.** 4 figs., 4 foot-refs. **DWB, DLC**—This paper describes a rapid response microwave grometer for continuously recording the water vapor pressure of atmospheric air over a de ambient range. The principle employed involves the measurement by means of a cavity onator of the contribution of water vapor to the refractive index of atmospheric air. The

device described also has potential application to the continuous measurement of the degr of contamination of one gas (or of gas mixtures) by another gas (or gases). *Subject Headin* **1. Microwave hygrometers.**—*Authors' abstract.*

9.10–126 551.508.

Wood, Rex C. (*General Mills, Inc., Minneapolis*), **Improved infrared absorption spect hygrometer.** *Review of Scientific Instruments*, Lancaster, Pa., 29(1):36–42, Jan. **1958.** 5 fig 7 foot-refs., 3 eqs. **DWB, DLC**—An infrared hygrometer is described which utilizes a lig beam as the principal sensing element. Composed of two narrow bands of infrared radiatio this beam traverses a 12-in. path through a sample atmosphere containing the humidi concentration to be measured. Wavelength isolation is by means of germanium narrow ban pass interference filters. One band, centered near a wavelength of 2.60μ is subject to attenu tion by water vapor, the other located near 2.45μ is not. Thus the ratio of transmitted ba energies is sensitive to the concentration of water vapor in the path. This ratio is effective maintained at unity through use of a servo-operated glass wedge which moves to compensa for energy unbalance caused by changes in absorbing vapor. Wedge position is given electric significance through use of an appropriate transducer, calibrated in terms of vapor densit grams per cubic meter. Included in the design is a dry-gas purge standardization syste whereby periodic checks of the zero point enable compensation for drift factors. Because the potential use of the method in airborne applications, the instrument was used in tests determine the character of pressure effects. These showed that vapor concentration (W total pressure (P), and partial pressure (p) of water vapor, may be related to fractional a sorption (A):

$$A = CW^{0.2}\,(P+p)^{0.23}.$$

Conditions under which other, simpler relations may be used are discussed. *Subject Headin* **1. Infrared absorption hygrometers.**—*Author's abstract.*

9.10–127 551.508.

Wylie, R. G. (*Div. of Physics, C.S.I.R.O.*), **A new absolute method of hygrometry, Pt. The general principles of the method.** *Australian Journal of Physics*, Melbourne, 10(3):35 365, Sept. **1957.** 2 figs., table, 14 refs., 7 eqs. **DLC**—This paper is the first of two which gi a detailed treatment of a new method of hygrometry. In this method an ionic single cryst is surrounded by the gas which is the subject of measurement, and the temperature of t whole is so adjusted that a very thin layer of saturated solution is formed on the crystal surfa and is brought to a constant thickness as determined electrically. The temperature th established provides a measure of the absolute humidity of the gas. In this first paper t general principles and theory of the method are dealt with and observed performance is ou lined. The method is compared with the conventional condensation method, the bas limitations of which are considered, and is shown to be considerably more accurate; it is al more convenient and can be at least as rapid in response. *Subject Headings:* **1. Electrolyt condensation hygrometer 2. Hygrometric measurement techniques.**—*Author's abstract.*

9.10–128 551.508.

Wylie, R. G. (*Div. of Physics, C.S.I.R.O., Univ. Grounds, Chippendale, N.S.W.*), **A ne absolute method of hygrometry, Pt. 2, The properties of potassium chloride crystal element** *Australian Journal of Physics*, Melbourne, 10(4):429–453, Dec. **1957.** 8 figs., table, 8 refs eqs. **DLC**—A new type of hygrometer, which has been termed the electrolytic condensatio hygrometer, was described in the first of the present two papers. Its capabilities and limit tions depend mainly on the characteristics of the conducting liquid layer formed on the surfa of the crystal element used; these characteristics depend in turn on those of the surface of t crystal. A detailed experimental investigation has been made of the relevant properties potassium chloride crystal elements. An explanation of these properties in terms of t structure of the crystal surface is given. This may be used as a basis for predicting the b havior to be expected of the hygrometer for a wide range of conditions. It has been conclude that at ordinary temperatures the method is capable of an absolute accuracy in the equilibriu temperature (or corresponding dew-point) of 0.01°C, is capable of detecting changes in th temperature of 0.002°C, and is capable of a time-constant of as little as a second. In additio

providing direct information on the behaviour of the hygrometer the experiments have vealed fundamental effects of some interest. The most significant of these demonstrate the istence of free energy barriers to crystal growth and crystal dissolution. Evidence has been tained that the vapour pressure of a layer of saturated solution only 80 A thick does not ffer from that of the bulk liquid by more than 0.15%. *Subject Headings:* **1. Electrolytic ndensation hygrometer 2. Hygrometric measurement techniques 3. Potassium chloride grometer elements.**—*Author's abstract.*

9.10–129 551.508.72:551.573

Kaulina, K. I., **Opyt primeneniia isparitelei GGI-500 i gidravlicheskogo isparitelia maloĭ odeli na sel'skokhoziaĭstvennykh poliakh Kamennoĭ Stepi.** [Experimental use of the GGI-00 evaporator and a small-model hydraulic evaporator on agricultural fields of Kamennaia ep'.] *Meteorologiia i Gidrologiia*, No. 1:47–50, Jan. **1957.** 2 figs., table, 3 refs. **DWB, LC**—The comparative measurements of evaporation were carried out in a barley field, in a llow field and in a grass field. Data on evaporation are presented in graphs and in a table. he hydraulic small model evaporator and the GGI-500 (wooden model) at a height of 100 cm ave higher evaporation rates than the GGI-500 (wooden and iron model) at 50 cm. Evapora-on in June and July 1953 from the wooden and iron evaporimeters (GGI-500) at 50 cm was entical; after the harvest the evaporation from the wooden model exceeded that from the on one. At the same time evaporation from GPI-51 (hydraulic evaporator) and the wooden odel at 100 cm was always higher than the models at 50 cm. The differences in evaporation e analyzed in relation to rainfall, soil moisture content, etc. *Subject Headings:* **1. Evapori-eters 2. Evaporation data comparisons 3. Kamennaia Steppe, U.S.S.R.**—*I.L.D.*

9.10–130 551.508.72

†Klausing, Otto, **Erfahrungen mit einem neuen Piche-Atmographen.** [Experience with a ew Piche atmograph.] *Meteorologische Rundschau*, Berlin, 10(5):158–162, Sept./Oct. **1957.** figs., 22 refs. **DWB, DLC**—The author describes a new Piche atmograph which by utilizing a bating principle records hourly and daily evaporation. The principle of this new device hich is similar to that of the Piche atmometer, its construction, installation, operation and valuation of the records are described with the aid of diagrams and photographs. The device as a recording clock with a 7-day drum revolution period, the latter is adapted to the water pply which normally is adequate for a week, also under tropical conditions. A nomogram r evaluating the curve records is presented, and data obtained with this device in El Salvador San Andrés) are presented. In addition, this study contains a discussion of the theoretical nd technical problems of measuring evaporation and potential evaporation with special eference to the use of the Piche-atmometer under transpirational and plant ecological condi-ions. *Subject Headings:* **1. Piche atmograph 2. Evaporation measurement techniques.**—*I.L.D.*

9.10–131 551.508.72

*Kuznetsov, V. I., **Issledovanie o vliianii teplovoĭ izoliatsii na pokazaniia vodnykh isparitelei.** Investigation on the effect of thermal insulation on the readings of hydraulic evaporimeters.] *eningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut, Trudy*, 45(99):173–181, **1954.** 2 figs., tables, 3 refs. **DLC** (GB651.L38)—In order to avoid the necessity of introducing transition oefficients in the reading of evaporimeters, it would be expedient to construct an evaporimeter ith a 3000 cm² surface, whose indications would be much the same as the reading of hydraulic vaporation pans. In this paper the author claims, on grounds of an analysis of observations ade at 4 runoff (discharge) stations (VALDAY, DUBOVKA, NIZHNE-DEVITSK, IASKHAN) in 952–1953, that in zones of sufficient and excessive moistening, one could use the ground vaporimeters GGI-3000 instead of evaporimeter pans with 20 m² surface, thermal insulation, nd slanted deflector. *Subject Headings:* **1. Transition coefficients of evaporimeters 2. Evap-rimeters.**—*A.M.P.*

9.10–132 551.508.72

*Kuznetsov, V. I., **O perekhodnykh koeffitsientakh nazemnykh isparitelei GGI-3000.** [On he transition coefficients of the ground evaporimeter GGI-3000]. *Leningrad. Gosudarst-*

vennyĭ Gidrologicheskiĭ Institut, Trudy, 45(99):142–156, **1954.** 5 figs., 6 tables, 11 refs., 9 eq
DLC (GB651.L38)—A method of conversion of readings of the ground evaporimeter GG
3000 to the evaporation from a 20 sq m evaporation pan is introduced and explaine
In using this method, the author constructs a scheme of isolines of the transition coefficie
from evaporimeter readings to values of a pan for the European, and a part of the Asiat
territory of the U.S.S.R. The scheme enables one to use data of network observations mad
by ground evaporimeters GGI-3000 for evaluating evaporation from the water surface o
Kolkhoz ponds, and small natural water reservoirs. *Subject Headings:* **1. Evaporimeter
2. Transition coefficient of evaporimeters 3. Evaporation from water surfaces.**—*A.M.P.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Short range forecasting** (Visscher et al.), 9.10–1; **Long range forecasting** (Belinskiĭ), 9.10–6; **Transosonde data utilization manuals** (Angell), 9.10–30; **Upper air analysis** (O'Connor), 9.10–31; **Air mass development** (Tschirhart), 9.10–187; **Temp. trends, Uccle** (Sneyers), 9.10–197; **Thickness chart estimation** (Wilson), 9.10–205; **Frontal passage effects on cumulus formation** (Dzhuraev), 9.10–236.

9.10–133 551.509.

Turkey. Devlet Meteoroloji Işleri Umum Müdürlügü. Telekommünikasyon Şefliği
Meteoroloji telsiz yayin programi. TSMO weather broadcast schedule, issue by the Tel
communications Dept., Turkish State Meteorological Organization, March 1, **1956.** Rev. ed
effective April 1, **1956.** 19 p. maps. Supersedes schedule dated Jan. 20, **1956. DWB**—
Maps show location of synoptic, pibal, rawin, radiosonde and other stations broadcast fro
Ankara on each of the synoptic hours (00, 03, 06, 09, 12, 15, 18 and 21 h), and a list shows tim
of various broadcasts for local (Turkish), and another for continental collections, and th
frequencies, contents of broadcasts, etc. *Subject Headings:* **1. Meteorological broadca
schedules 2. Synoptic networks 3. Turkey.**—*M.R.*

9.10–134 551.509.21(62

*Egypt. Meteorological Dept., **Daily Weather Report [and] Daily Weather Repor
Synoptic Charts, Aug. 1–Sept. 30, 1957.** sheets (34×52 cm) fold. Daily. **DWB**—The dail
weather report gives extensive data for the 3 synoptic hours (12h, 18h and 06h) and for th
day at about 40 Egyptian stations, plus the upper air winds 3 times daily at 11 stations, an
ship reports in code, plus the forecast for Egypt and Cairo. The weather map embraces th
area from the Baltic to the N. frontiers of East Africa (55°N to 5°N) and from Brest in th
west to the Persian Gulf in the east (0° to 55°E). Four separate charts include: 1) 1200
surface chart, 2) 0600 the next day surface chart, 3) 700 mb chart for 1200 and 4) 500 mb cha
for 1200 the previous day. For brief abstract on this series, *see* 2J–231, Oct. 1951, *MAB*
Subject Headings: **1. Daily weather maps 2. Daily weather reports 3. Observational dat
4. Egypt 5. Mediterranean region.**—*M.R.*

9.10–135 551.509.21(64

*France. Météorologie Nationale, **Bulletin quotidien de renseignements météorologique
de l'Afrique du Nord.** [Daily bulletin of meteorological reports of North Africa.] Vol. 7
No. 244–273, Sept. 1–30, **1957.** 30 sheets (32×42 cm). **DWB**—Each of these daily weathe
reports contains a full page, analyzed, pressure and frontal map of West Europe and N.W
Africa (isobars at 5 mb intervals) plus a tabulation of the 06h weather elements (temp
precip., cloud amount, wind and misc. phen.) reported by synoptic stations in Algeria, Morocc
and Tunis, and winds aloft up to 5500 m at 10 stations. (For monthly and annual climat
logical bulletin, *see* 8.4–97, April, 1957, *MAB*.) *Subject Headings:* **1. Daily weather report
2. Daily weather maps 3. Observational data 4. Northwest Africa.**—*M.R.*

9.10–136 551.509.31:551.579.

Kozik, E. M., **Ob aerosinopticheskom metode kratkosrochnykh prognozov pavodkov n
gornykh rekakh sredneĭ Azii.** [Aerosynoptic method of short range forecasting of flood
for the mountain rivers of Central Asia.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institu

atematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 247–2. 3 refs.) **DLC**—The relationship of weather elements in various synoptic situations to od occurrence in mountain rivers is investigated on the basis of an eight year study of the irchik River which is near Tashkent. The influence of individual elements upon flood mation varies with the synoptic processes. In the case of cyclones the best relationships th the magnitude of floods is given by the following factors: the temperature and specific midity in the warm sector of the cyclone at a height of 1 km above sea level; temperature at e condensation level rising dry adiabatically from 1 to 2 km level, both in the warm and in the ld sector of the cyclone; the height of the dry adiabatic rise to the condensation level for air ing from 1 and 2 km both in warm and cold front of a cyclone; number of warm days preced- g the flood at the 2 km level; and time of year. In the case of cold invasions and nonfrontal ocesses, the following factors are closely associated with floods: the temperature at 2 km terior to the front; number of warm days; the flood at 2 km above sea level preceding the ont; and the time of the year. The making of the forecasts and their utilization are discussed. *ubject Headings:* **1. Short range flood forecasting 2. Synoptic conditions for floods 3. Chir- ik River, Tashkent, U.S.S.R.**—*I.L.D.*

9.10–137 551.509.311(67) 551.515.8:551.553.8

Jeandidier, G. and Rainteau, P., **Prévision du temps sur le Bassin du Congo.** [Weather recasting in the Congo Basin.] *France. Météorologie Nationale, Monographies*, No. 9, ov. **1957.** 13 p. 13 figs. **DWB**—In this part of Africa, the disturbances are generally used either by isolated thunderstorms, or by squall lines. This note sets forth some remarks lative to the formation and evolution of these phenomena. The author examines suc- ssively the thunderstorms in the center of the monsoon, the thunderstorm systems, the uall lines and the monsoon. Several local thunderstorms develop in the course of the after- on in the center of the monsoon stream, strong thunderstorm systems can appear along the nvergence limit monsoon/E.ly-wind. The thunderstorm systems are at the origin of the rmation of the squall lines which move like cold fronts with the wind stream between 3000 d 5000 m. *Subject Headings:* **1. Structure of disturbances 2. Thunderstorms 3. Squall nes 4. Congo Basin.**—*A.V.*

9.10–138 551.509.317:551.511

Bodolai, István, **Az advektív-dinamikus analízis alapelvei.** [Basic principles of advective- ynamic analysis, Pt. 1.] *Időjárás*, Budapest, 55(9/10):278–281, Sept./Oct. **1951. Pt. 2, légnyomás és hőmérséklet advektív-dinamikus változásai.** [Advective dynamic changes of essure and temperature.] *Ibid.*, 55(11/12):318–323, Nov./Dec. **1951.** 2 figs., eqs. **DLC**— these first two of a series of five articles on POGOSIAN's and TABOROVSKIĬ's method of ad- ctive dynamic analysis, the basic principles of the method are set out and problems of dvective dynamic pressure and temperature changes are discussed. (For Pts. 3–5, *see* 10–121 and 5.9–115, Oct. 1953 and Sept. 1954, *MAB.*) *Subject Headings:* **1. Advective ynamic analysis 2. Dynamic pressure changes 3. Dynamic temperature changes.**—*G.T.*

9.10–139 551.509.32:551.577.38

Palmer, Wayne C. (*Off. of Climatology, U. S. W. B., Wash., D. C.*), **Drought in western ansas.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 43(43):7–8, Oct. 22, **1956.** g. **DWB, DLC, DA.** Also his: **Does a wet March signify the end of a drought?** *Ibid.*, 4(14):8, April 8, **1957.** fig., 2 refs. **DWB.** Also his: **Soil moisture.** *Ibid.*, 44(15):4, pril 15, **1957. DWB**—In a series of 3 articles on the drought in western Kansas, based on 0 years of soil moisture and rainfall data since 1887, the author shows several important spects of the climax and ending of this one of the 3 worst droughts on record. In the first rticle a graph shows the cumulative drought index for the 1892–94, the 1954–7 and 1934–7 roughts. A study of 14 drought periods ranging from 4 to 88 months showed 13 out of 14 nding during Oct.–March. The 1892–4 drought was the most intense, the 1932–9 the longest nd the present one a close record in both respects. In the 2nd paper the author shows that if, s in 1957, March has >150% of normal precipitation (70 years record for Western Kansas), he following month will be above normal in 3 cases out of 4, whereas if March precipitation

is <50% of normal, above normal precipitation occurs on only 25% of the following monti
A chart shows for the Great Plains, the areas where the "chances" are that the drought l
ended this year. The third paper represents a study of 70 years of weather records for Weste
Kansas, using Thornthwaite's method based on an assumed available root zone capac
of 6″ of water. It shows that the observed non-fallow moisture on April 1, 1957 of 2.8
would indicate that storage on May 1 would be from 2″ to 4″, and that by June 1 compl
depletion could occur 1 year out of 10, and that by July 1 in 4 years out of 10, and on Aug.
9 years out of 10. However in only 2 to 5 years out of 10 have moisture shortages develop
during June. *Subject Headings:* **1. Soil moisture forecasts 2. Droughts, Western Kans
3. Drought forecasting 4. Great Plains 5. Western Kansas.**—*M.R.*

9.10–140 551.509.33:551.590

Takahashi, K. (*Met. Res. Inst., Tokyo*), **Tidal oscillation on the sun as the cause of t
periodicities in the meteorological phenomena (Studies on the seasonal weather forecastin
Pt. 6).** *Papers in Meteorology and Geophysics*, Tokyo, 7(4):347–357, Jan. **1957.** 2 fig
8 tables, 18 refs. **DWB**—Tidal oscillations on the sun raised by the planets, such as Jupit
Venus, Earth and Mercury, were calculated assuming an equilibrium theory. The calculat
periods of the main tides were 12.6, 14.1, 13.4, 17.5 and 14.6 days (corresponding to semidiurn
tides in the ocean), 3.89, 6.55, 1.475, 9.59, 2.375, 3.013, 13.318, 1.903, 5.576 and 2.890, mont
(corresponding to long periodic tides). Such periodicities were searched for in the sunspo
the solar constants, 700 mb heights, surface pressures and others, and it was proved th
some of them were statistically significant. We may conclude, therefore, that the so
activities are affected by the tidal oscillations, and such periodicities appear in the atmosphe
through solar radiations though the mechanism is not clear. The order of magnitudes of t
relative amplitudes of such periodicities was $10^{-4}\sim10^{-5}$ for both solar activities and meteor
logical phenomena. Therefore, such variation may be neglected so far as daily variatio
are concerned, but, it cannot be neglected in dealing with monthly or annual variations in t
meteorological phenomena. *Subject Headings:* **1. Seasonal forecasting 2. Solar-weath
relationships 3. Periodicities.**—*Author's abstract.*

9.10–141 551.509.54:551.515

Fukunaga, M., **Forecasting the rainfall amount over the upper drainage area of the Riv
Yoshino caused by typhoon.** *Journal of Meteorological Research*, Tokyo, 8(11):676–68
Dec. **1956.** 14 figs., 5 eqs. In Japanese; English summary p. 676. **DWB, DLC**—The auth
examined a method of forecasting of rainfall amount over the upper drainage area of the Riv
Yoshino caused by typhoon. First, some relationships between the rainfall amount and t
various elements of typhoon were examined graphically. Next, the ratio of rainfall amou
of adjacent area to Takayabu area was obtained. *Subject Headings:* **1. Typhoon rainfa
forecasting 2. Rainfall amount 3. Yoshino River Basin, Japan.**—*Author's abstract.*

9.10–142 551.509.59:551.579

Kharshan, Sh. A., **K metodikep rognoza talogo stoka gornykh rek.** [Method of for
casting melt water runoff of mountain rivers.] *Meteorologiia i Gidrologiia*, Leningrad, N
3:46–51, March **1957.** 3 figs., table, 7 refs., 4 eqs. **DWB, DLC**—In the present method
forecasting melt water runoff from relative indicators of snow resources it is not possible
take into account the nature of snow accumulation in individual elevated zones of a basi
A method for computing the distribution in elevated zones of a basin is developed on the bas
of relative snow accumulation indices for elevated zones determined by ordinary hydrologic
practice and upon the determination of heat flow during the snow melt period from air te
perature. Equations for computing the amount of melt water formed at specific zones
elevation and for computing the sum of positive temperature necessary for snow melting an
a graph showing the variation of air temperature totals necessary for snow melting wit
elevations are presented. The application of this procedure to forecasting flood runoff for th
Yenisei River basin is illustrated. *Subject Headings:* **1. Snow melt runoff forecasting 2. Sno
accumulation indexes 3. Yenisei River Basin, Asiatic U.S.S.R.**—*I.L.D.*

9.10–143 551.509.59:551.579

Mashukov, P. M., **Osnovnye metody gidrologicheskikh prognozov, primeniaemye v dneĭ Azii.** [Main hydrological forecasting methods used in Central Asia.] (In: Akaniia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia Uzbekistane.** Tashkent, **1955.** p. 253–261. 8 figs., eqs.) **DLC**—Hydrological forecasts Central Asia are concerned primarily with irrigation, agriculture and the production of droelectric energy so that the forecasting of water discharge is of fundamental importance. uations are developed for forecasting the mean monthly discharges of water for the summer iod. These are of the form:

$$Q' = a - \frac{Q}{t+t_0} + b \qquad \text{or} \qquad Q' = aQ(t_1 - t) + b,$$

here Q' = monthly flow or mean discharge to be forecast, Q = flow for the preceding month, mean air temperature for one of the high mountain stations for the same period as Q; b and t_0 = constants to be selected. Forecasting the appearance of underwater ice is of the m:

$$ax + b\sum_{n-2}^{n} t + y + c = 0,$$

ere x = distance from the mouth, n = time of appearance of underwater ice, t = mean daily temperature, y = seasonal correction and c = a constant number. *Subject Headings:* **Hydrologic forecasting 2. Water discharge forecasting 3. Hydroelectric power 4. Central a.**—*I.L.D.*

WEATHER CONTROL

See also: **Fruit-frost service, U. S. W. B., Calif.,** (Young), 9.10–70; **Artificial cumulus formation** (Soulage), 9.10–232.

9.10–144 551.509.6:662.2:539.,

Bengelsdorf, Irving, **Can the atom change the weather?** *Saturday Review,* p. 31–361 y 7, **1956.** figs. **DLC**—The author takes exception with the general opinion (among teorologists) that the atom or H-bomb has not affected the weather. He bases his argument LANGMUIR's idea of "divergent" phenomena or trigger action. Possible effects of atomic ris or radiation in triggering clouds, changing the electrical conductivity of the atmosphere the radiation received from the sun or emitted to space are cited. *Subject Headings:* **Atomic explosion effects on weather. I. Langmuir, I.**—*M.R.*

9.10–145 551.509.6:551.585.5

Brier, Glenn W. (*U. S. Weather Bureau, Wash., D. C.*), **Some problems in utilizing water ources of the air.** (In: White, Gilbert F. (*ed.*), **The future of arid lands.** Wash., D. C. erican Association for the Advancement of Science, **1956.** p. 314–319. 12 refs.) **DLC**—e various problems connected with the collection and interpretation of the meteorological a needed to control weather in arid regions are discussed. These include a survey of the isture resources available in the atmosphere, especially in the form of clouds, the temporal l spatial distribution of freezing nuclei, and the use of these data in cloud seeding operations estimating the economic value of weather modification, etc. *Subject Headings:* **1. Weather trol in arid zones 2. Cloud seeding 3. Arid zones.**—*I.L.D.*

9.10–146 551.509.6

Spilhaus, Athelstan, **Control of the world environment.** *Geographical Review,* N. Y., 4):451–459, Oct. **1956.** 2 foot-refs. **DWB, DLC**—In this general discussion of man's d and ability to control his environment in order to satisfy increasing requirements for d, shelter, etc., the author touches on the use of controlled atmospheric and hydrologic le for production under greenhouse conditions and in deserts, for example, the utilization the fresh water of polar regions in areas of water shortage but with suitable heat and light

conditions, the use of solar energy, the artificial production of rainfall, the disruption of hu canes, etc. *Subject Heading:* **1. Weather control.**—*I.L.D.*

9.10–147 551.509.6

Ohashi, K., **On the effect of making smoke screens for protection against frost.** *Jap Central Meteorological Observatory, Tokyo, Memoirs of Industrial Meteorology*, 19(1):15– Dec. **1955.** 4 figs., 2 tables, 3 refs., 2 eqs. In Japanese; English summary p. 17. **DLC** There was hard frost damage in almost all of the district of Hokkaido on Oct. 5, 6, 19 but frost did not fall in the Iwamizawa district where smoke screens were created by fi The author calculated minimum temperatures near the ground by the formulas of BRUNT a JACOBS, and ascertained the effect of smoke screens for the protection. Results are shown table and fig. *Subject Headings:* **1. Frost protection 2. Smoke screens.**—*Author's abstract*

9.10–148 551.509.6

Kobayashi, T. (*Inst. of Low Temp. Sc., Hokkaido Univ.*) and Okita, T. (*Asahikawa Bra of Hokkaido Gakugei Univ.*), **Outline of the studies on artificial precipitation in Hokka District.** *Papers in Meteorology and Geophysics*, Tokyo, 7(3):328–330, Oct. **1956.** tab 2 refs., eqs. **DWB**—In Hokkaido District, the operation of cloud seeding with AgI smo or NaCl particles was not carried out in the last two years, on account of copious rainfall the hydroelectric power source area which led to disastrous flood on the lower part of t rivers. Only a few trial seedings with a ground based AgI generator were conducted by t Hokkaido Electric Power Co. at Eoroshi (in the mountainous district of Daisetsu) in t summer of 1954. Our efforts have been directed toward basic research on the mechanism precipitation and on artificial weather modification rather than on the practical seeding ope tion. *Subject Headings:* **1. Cloud seeding effects 2. Artificial precipitation 3. Precipitati mechanics 4. Hokkaido District, Japan.**—*Authors' abstract.*

9.10–149 551.509.62:634

Nagano, Japan. Weather Station, **On the experiments for prevention of frost dama by heavy oil burning in apple orchards.** *Japan. Meteorological Agency, Tokyo, Memo of Industrial Meteorology*, 20(1):23–28, Oct. **1956.** 5 figs., 3 tables, 2 refs. In Japane English summary p. 28. **DLC**—The experiments for prevention of frost damage by heavy burning in apple orchards were carried out at Suzaka in Nagano Prefecture on the nights 20–21 April, 13–14 May, 1955. In the experimental field of about 36×33 sq m, heavy burning was continued from 2:02 to 5:00 a.m. on 14 May, 1955. The results were as follo 1) Before burning, the inversion level was formed at the height of 2 m and the air temperatu around the inversion level was distinctly lower than that at other levels. This phenomen seems to be due to the outgoing radiation from this level. 2) During the burning the inversi level rose to a height of about 2.5 m, and the temperature rise was 3.9°C in the layer bel the inversion level 1 hour after firing, 1.5°C in the inversion level 1.5 hour after firing, a 2.4°C in the layer above the inversion level 1¾ hour after firing. 3) The maximum value the curve of horizontal distribution of temperature rise was 3.5°C at the height of 1.5 m at t center of the field 1 hour after firing. The warm air region was transferred from the w part to the center of the field, and then conversely westward. *Subject Headings:* **1. Fr damage prevention 2. Smudging of orchards 3. Apple orchards 4. Suzaka, Japan.** *Author's abstract.*

9.10–150 551.509.67:551.57

Itoo, K. and Hama, K. (*both, Met. Res. Inst., Tokyo*), **Freezing of supercooled wat droplets, Pt. 1, Preliminary report.** *Papers in Meteorology and Geophysics*, 6(3/4):246–2 Jan. **1956.** 20 figs. (incl. photos), 6 refs. **Pt. 2,** *Ibid.*, 7(2):99–106, July **1956.** 12 figs. (in photos), 2 tables, ref., eq. **DWB**—In Pt. 1, an experiment was conducted in which a wa droplet was frozen to find the effects of artificial rain-making. Taking a distilled water dr a drop of silver iodide suspension in pure water and further a raindrop, their freezing temper ture was observed. As the variance of the temperature was great in each case, some improv ment was found necessary for practical use. In Pt. 2, many supercooled water-droplets we frozen on a cooling brass plate to find the effects of artificial rainmaking. The water-drople

ere contaminated with silver iodide smoke and some soil and mineral powder. Freezing emperature was found for each contaminated substance. Freezing temperature of melted now crystals was observed. *Subject Headings:* **1. Freezing of supercooled water 2. Cloud eeding experiments 3. Freezing point of water.**—*Authors' abstracts.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE

9.10–151 531.52:551.510.3:534:551.596.1

Groves, G. V., (*Dept. of Physics, Univ. College, London*), **Determination of impact point f a vertically-falling body of acoustical observations.** *Journal of Atmospheric and Terrestrial hysics*, London, 11(3/4):284–288, **1957.** 2 refs., 18 eqs. **DLC**—Simple formulas are ob- ained for calculating the co-ordinates of the impact point of a vertically-falling body from the rrival times of its shock wave at a number of microphones on the ground. The effects of ind and variations in the speed of sound are taken into account. When the microphones re closely spaced, the direction of the impact point can be found. *Subject Headings:* **1. Falling odies 2. Shock waves.**—*Author's abstract.*

COMPOSITION OF THE ATMOSPHERE

9.10–152 551.510.41:546.291

Bates, D. R. and McDowell, M. R. C. (*both, Dept. of Applied Mathematics, the Queen's niv. of Belfast*), **Atmospheric helium.** *Journal of Atmospheric and Terrestrial Physics*, ondon, 11(3/4):200–208, **1957.** fig., 30 refs., 19 eqs. **DLC**—Calculations are carried out n the escape of helium, using a less crude model of the thermosphere than did earlier workers. ow rates are obtained. It is found that He^4 atoms could not escape as rapidly, as they are pparently being released from the crust, unless the temperature at the base of the exosphere ere higher than seems consistent with the number of He^3 atoms present. The hypothesis hat escape occurs during occasional brief intervals of enhanced solar emission is found to be ifficult to accept. A solution to the basic problem does not appear to be provided by invoking urorae, solar gas or interplanetary dust. The validity of the customary assumption that tmospheric helium is in equilibrium is queried. *Subject Heading:* **1. Helium atmosphere.**— *Authors' abstract.*

9.10–153 551.510.41:551.577.1

Durov, S. A. and Fedorova, N. E., **Istochniki ionno-solevogo sostava atmosfernykh sadkov SSSR.** [Sources of the ionic-saline composition of atmospheric precipitation.] *Akademiia Nauk SSSR, Doklady*, 103(4):663–665, **1955.** 2 figs., table, 10 refs. **DLC.** Also: Chilingar, George V. (*Hq. AMC, Wright-Patterson A. F. Base, Ohio*), **Durov's classification f natural waters and chemical composition of atmospheric precipitation in USSR: a review.** *American Geophysical Union, Transactions*, 37(2):193–196, April **1956.** 3 figs., table, 6 refs. **DWB, DLC**—Extensive observations of the salt content of the atmosphere (precipitation, ain, snow, hail) carried out over the U.S.S.R. are analyzed with reference to the marine or ontinental origin of these salts. An analysis of atmospheric salt samples indicates that only 7% of the salt of atmospheric precipitation over the U.S.S.R. is of marine origin while the est of the salts enter the atmosphere as aerosols from the surface of continents. A table iving the mean composition of 190 specimens of atmospheric precipitation over the U.S.S.R. nd calculation of their original composition is presented. These conclusions are based on amples obtained in coastal regions. The percentage of salts of continental origin would robably prove greater if more interior areas had been included. The article by Chilingar eviews Durov's **Classification of natural waters . . .** (*see Akademiia Nauk, SSSR, Doklady*, 9(1):87–90, **1948**) and the above article by Durov and Fedorova. *Subject Headings:* **. Air sampling and analysis 2. Salt content of precipitation 3. Marine influences . U.S.S.R.**—*I.L.D. and M.R.*

9.10–154 551.510.41:546.264:577.3:551.4

Eriksson, E. and Welander, P. (*both, Intern. Met. Inst. Stockholm*), **On a mathematic model of the carbon cycle in nature.** *Tellus*, Stockholm, 8(2):155–175, May **1956.** 17 fig 14 refs., 4 eqs. **DLC**—A discussion is given of a simple mathematical model of the carb dioxide cycle in atmosphere-biosphere-sea, with special attention to the possibility of se sustained oscillations and to the behavior of the cycle when additional carbon dioxide injected from an outer source. The discussion is confined to phenomena with characteris times of the order of $10–10^3$ years leaving out the long geologic periods as well as the pure annual periods. Some numerical computations are also carried out on the electronic computi BESK. The discussion and the computations show that self-sustained oscillations possib appear due to the presence of the sea, and that they generally are favoured when there exi time-lags in the biosphere of the order of a few decades. The computations also indica that additional carbon dioxide injected at a rate corresponding to the present combustion fossil carbon does not change significantly the carbon dioxide concentration in the atmosphe since most part of it will be stored in the biosphere. Thus, the present theory suggests th the increase of carbon dioxide indicated by recent measurements may represent part of natural self-sustained oscillation and not necessarily be a response to an increased combustio of fossils. *Subject Headings:* **1. Carbon dioxide cycle 2. Carbon dioxide variations.**—*Author abstract.*

9.10–155 551.510.41:546.1

Tanaevsky, Olga, **Résultats de dosages du peroxyde d'azote atmosphérique.** [Resul of atmospheric nitrogen peroxide measurement.] *Académie des Sciences, Paris, Compt Rendus*, 243(18):1348–1349, Oct. 29, **1956.** table, 3 refs. **DLC**—Atmospheric NO_2 co centration was measured using a silica gel technique which is described in detail. Five samp lings were made in Paris and three at Val Joyeux (June–Oct. 1956), each sampling involvin 1000–1500 l of air. The average NO_2 content was found to be $1.26\times10^{-6}\%$ at Paris an $0.3\times10^{-6}\%$ at Val Joyeux. Slightly higher concentrations appear to occur during cloud weather than in clear weather. *Subject Headings:* **1. Nitrogen peroxide in atmosphere 2. Pari France.**—*G.T.*

9.10–156 551.510.41:546.214:546.1

Tanaevsky, Olga, **Sur le dosage chimique de l'ozone atmosphérique.** [Chemical measur ment of atmospheric ozone.] *Académie des Sciences, Paris, Comptes Rendus*, 244(7):924–92 Feb. 11, **1957.** 5 refs. **DLC**—Comparative experiments show that the presence of nitroge peroxide in the air is not a source of error in the chemical measurement of ozone. *Subje Headings:* **1. Ozone measurements 2. Nitrogen peroxide in atmosphere.**—*Trans. of author abstract.*

ATMOSPHERIC POLLUTION

See also: **Atmos. pollution from chem. industries,** 9.10–98; **Smoke diffusion** (Frankenberger), 9.10–100; **Drag coefficient of dust** (Gillespie, Gunter), 9.10–207; **Wind distribution of volcanic ash** (Shrock), 9.10–217.

9.10–157 551.510.4

Cappel, Raymond L. and Mills, Kenneth D. (*Southwest Res. Inst., San Antonio*), **Researc and cooperative effort solution to air pollution—major urban problem.** *Southwest Technic Calendar*, San Antonio, 2(9):1–3, Sept. **1955.** ports. of authors.—The authors discuss th origin of the smoke pollution problem with particular reference to its manifestation in Lo Angeles and the steps needed for its control. *Subject Headings:* **1. Atmospheric pollutio 2. Smoke 3. Los Angeles, Calif.**—*I.L.D.*

9.10–158 551.510.4

Clayton, George D.; Arnold, James R. and Patty, Frank A., **Determination of sources o particulate atmospheric carbon.** *Science*, Wash., D. C., 122(3173:751–753), Oct. 21, 1955 fig., table, 6 refs. **DLC**—Carbon-14 measurements in samples of polluted air taken in th

os Angeles Basin are useful in determining the portion of contaminant that is due to organic rbon and the portion coming from fossil fuels, since the latter have no C^{14} activity, and the rmer have an almost constant C^{14} ratio. Material from 1000 to 40,000 yrs in age contain arying amounts of C^{14}, but the atmosphere over the cities contains either contemporary or uch older carbon. Procedures, sampling periods and locations (in Detroit and Los Angeles), eather conditions, etc., are discussed. *Subject Headings:* **1. Atmospheric pollution sources C^{14} measurements of polluted air 3. Los Angeles, Calif. 4. Detroit, Mich.**—*M.R.*

9.10–159 551.510.42:551.521.16(421)

Currie, Gordon, **The London blackout.** *Weather*, 10(4):136, April **1955. DWB**—Describes in detail the setting in of a blackout with fall of temperature when the smoke pall om the manufacturing area to the north and east drifts across Northallerton. *Subject eadings:* **1. Smoke pall 2. London, Eng.**—*C.E.P.B.*

9.10–160 551.510.42

Jeney, Endre and Szendrei, Sandor, **Issledovanie zagriazneniĭ vozdukha pri pomoshchi ikrobiologicheskikh metodov. Stimuliruiushchee deĭstvie okisi ugleroda na protsess rmentatsii i ee rol' v reaktsii Pastera.** [Investigation of air pollution by means of microological methods. Stimulating action of carbon dioxide on the process of fermentation and s role in Pasteur's reaction.] *Gigiena i Sanitariia*, Moscow, 21(11):36–42, Nov. **1956.** figs., refs. **DLC**—In order to determine the presence and amount of poisonous contaminants the atmosphere, the authors propose the use of beer yeasts (*Sacharomyces cerevisiae*) because the capacity of this organism to ferment carbohydrates and to produce CO_2. The amount gas evolving in Einborn fermentation test tubes was determined. The procedure and results the evaluation of the effect of SO_2 and CO upon fermentation in order to determine the nount of these substances in the atmosphere are described. Graphs showing the decline in O_2 formation in the presence of SO_2 and HCN and its increase in the presence of CO are resented. Also, the results of microcolorimeter studies as the mechanism of action of carbon onoxide (CO) are discussed. *Subject Headings:* **1. Atmospheric pollution experiments Carbon dioxide in the atmosphere.**—*I.L.D.*

9.10–161 551.510.42:697.8

Kazanskiĭ, A. E. and Monin, A. S., **O forme dymovykh struĭ.** [On the shape of smoke lumes.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 8:1020–1033, Aug. **1957.** 12 gs. (incl. photos), 7 refs., 11 eqs. **DLC**—The authors present the results of measurements n the form and behavior of smoke plumes released from smoke generators situated at the round. The smoke generators were placed on a straight line about 2 m apart, the smoke was hotographed by a motion picture camera and gradient measurements of temperature and ind velocity were made 0.5, 1, 2, 4 and 8 m at a distance of 500 m from the point of smoke elease. Equations are developed for calculating the height of smoke plumes at different istances from the source, for calculating the form of the smoke plumes and for determining ne concentration of smoke. Photographs and diagrams of the smoke plumes and graphs nowing temperature profile during smoke release, the relationship of the height of the smoke s a function of friction, vertical distribution of smoke density, etc. are presented. *Subject eadings:* **1. Smoke plume behavior 2. Smoke plume meteorology.**—*I.L.D.*

9.10–162 551.510.42:551.510.7

White, Fred D. and Pack, Donald H., **Meteorology as related to reactor-site selection.** *ir. Pollution Control Association, Journal*, 6(3):151–153, 170, Nov. **1956.** 5 figs., 8 refs., eqs. **DLC**—Meteorological parameters (such as wind direction and speed, atmospheric tability and precipitation) affecting the propagation of atmospheric effluents, theories for alculating atmospheric diffusion, and meteorological observations to be made at reactor tes are discussed along with some special applications of meteorology, like control of radioctive waste disposal, routine monitoring of radioactivity, investigation of reactor accidents, nd forecasting of possible hazards. *Subject Headings:* **1. Atmospheric pollution dispersal Radioactive waste disposal 3. Stack meteorology 4. Reactor sites.**—*G.T.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Tropospheric temps.** (Antonov, Makhover), 9.10–200; **Auroral zone attenuation of high frequency radio waves** (Agy), 9.10–304.

9.10–163 551.510.534:551.521.

Adel, Arthur, **Seasonal variation in the absorption of solar radiation by atmospher ozone at 9.6 microns.** *American Meteorological Society, Bulletin*, 35(6):250–252, June 195 3 figs., 2 tables, 3 refs. **DWB.** Also issued as: Arizona. State College, Contract AF 19(122 198, Scientific Report, No. HA-5, Dec. 1, **1953.** 5 p.. 3 figs., 2 tables, 2 refs.—A record presented of the absorption of solar radiation by atmospheric ozone in the interval 9.2–10 microns. Seventy-two independent observations made on seventy days are scattered ov the various months of the year. The data are suitable for a first examination of the season trend of stratospheric ozone as revealed by an infrared band. The absorptions are reduce to a quantity proportional to the amount of ozone, and the curve of seasonal change in th quantity is strikingly similar to the seasonal trend in ozone as revealed by the long accepte method of ultraviolet absorption. This further usefulness of the 9.6 micron band of ozo as an atmospheric parameter is thus established. *Subject Headings:* **1. Seasonal solar radiatio absorption variations 2. Ozone variations.**—*Author's abstract.*

9.10–164 551.510.5

Berg, Hellmut, **Zur Auswertung und Deutung von Aufnahmen von Ionosphärenstörunge nach der Impuls-Echo-Methode.** [Evaluation and interpretation of records of ionospher disturbances obtained by the impulse echo method.] *Beiträge zur Physik der Atmosphär* Frankfurt a.M., 29(4):276–289, **1957.** 6 figs., 2 tables, 10 refs., eqs. German, English au French summaries p. 276. **DWB, DLC**—By means of the usual assumptions in the evaluatio of records made by the impulse-echo-method some conclusions can be drawn which can l checked statistically. The statistical results do not indicate that the very general consider tions of PÜTTER are realized as a rule. The actual scatter of the time vectors (standard vect deviation) is computed as function of the absolute value of the mean time vectors; the numbers are compared with the values to be expected theoretically. If σ is the observe scatter, σ_A the scatter due to the errors in reading off the data, σ_P the scatter due to the di tribution of the end-points of the time vectors of PÜTTER's straight line, and σ_T a turbulen scatter, then

$$\sigma^2 = \sigma_A^2 + \sigma_P^2 + \sigma_T^2.$$

The equation is poorly satisfied. The assumptions on which it is based are stated precisel and the question of their realization in nature is discussed. *Subject Headings:* **1. Ionospher records 2. Impulse soundings.**—*Author's abstract.*

9.10–165 551.510.53

Bhargava, B. N. (*Kodaikanal Obs., Kodaikanal*), **Observations of spread echoes from th *F* layer over Kodaikanal: a preliminary study.** *Indian Journal of Meteorology and Geophysic* New Delhi, 9(1):35–40, Jan. **1958.** 5 figs., 10 refs. **DWB, DLC**—Occurrence of spread echoes at Kodaikanal for a period of about one year has been analyzed and diurnal and season characteristics have been found to exist in the frequency of occurrence of these echoes. has been found that the phenomenon occurs only during night-time with largest frequenc between 1900 and 0400 hrs local time. While the seasonal variation is characterized b equinoctial maxima as in the case of geomagnetic activity, the day-to-day variations in scatte ing indicate a negative correlation with the degree of magnetic activity. Thus, scatterin persists for largest percentage of time during comparatively quiet periods and is often alt gether absent on magnetically stormy nights. The phenomenon is discussed in relation t ionospheric irregularities and radio-star scintillation. *Subject Headings:* **1. Spread *F* variation 2. Kodaikanal, India.**—*Author's abstract.*

9.10–166 551.510.535:551.594.1

Burke, M. J. and Jenkinson, I. S. (*both, Physics Dept., Univ. of Queensland, Brisbane*) **Ionospheric drifts at Brisbane.** *Australian Journal of Physics*, Melbourne, 10(3):378–38

ept. 1957. 7 figs., table, 9 eqs. **DLC**—Examination of fading of signals recorded at closely paced receivers has been used to measure the velocity of horizontal drifts of ionization in the onosphere. Systematic observations have been made for a period of 2 years, on a frequency f 2.28 Mc/s. The results show good agreement with the horizontal velocities of ionized regularities in the E and F_2 regions of the ionosphere as determined by other methods at imilar latitudes. The speeds are less than those observed at higher latitudes. The results or the E region have been analyzed for 24, 12 and 8 hr solar harmonics. The 12 and 8 hr armonics show large seasonal phase changes in the northward component is in fair agreement ith the results at higher latitudes in summer only, whereas the phase for the eastward com- onent is generally consistent with the results at higher latitudes for all seasons. The F egion 12 hr harmonic has a larger seasonal phase change in the eastward component than in the orthward component. *Subject Headings:* **1. Ionospheric ionization drift 2. Brisbane, ustralia.**—*Authors' abstract.*

9.10–167 551.510.535:551.593.12:621.396.8

Dagg, M. (*East African Agri. and For. Res. Org., Kenya*), **The origin of the ionospheric regularities responsible for radio star scintillations and spread-F, Pt. 1, Review of existing heories.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):133–138, **1957.** 4 refs. **DLC**—The present state of knowledge about the irregularities responsible for radio- tar scintillations is summarized, and the existing theories of the origin of these irregularities re discussed. All of the suggestions are shown to be inadequate to explain the observed eatures of scintillations and spread F. It is shown that any ionizing agent from outside the arth's atmosphere is unlikely to be responsible for the ionospheric irregularities that cause adio-star scintillations, and that the mechanism for their production must be sought in the errestrial atmosphere. (For Pt. 2, *see* 9.10–168.) *Subject Headings:* **1. Radio star scintillation . Spread F 3. Ionospheric irregularities.**—*Author's abstract.*

9.10–168 551.510.535:551.593.12:621.396.8:551.551

Dagg, M. (*East African Agri. and For. Res. Org., Kenya*), **The origin of the ionospheric regularities responsible for radio-star scintillations and spread-F, Pt. 2, Turbulent motion n the dynamo region.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):139–50, **1957.** 5 figs., 22 refs., eqs. **DLC**—A theory is presented which attributes the occurrence f ionospheric irregularities in the F-region to turbulent wind motion in the dynamo region t a height of 110–150 km. The resulting turbulent component of the electric potential ield produced is communicated to the F-region, as suggested by MARTYN (1955), where nagneto-electric forces then cause the ionization to form eddies. It is suggested that the bsence of daytime scintillations is due to the inhibition of turbulent flow by large tem- erature gradients during the day. The theory is then compared in detail with observations nd shown to be capable of explaining all the major features of radio-star scintillations, to- ether with such diverse results as the long-term correlation of scintillation amplitude with nagnetic activity and the variation in the occurrence of spread F and scintillations at different arts of the earth over the sunspot cycle. *Subject Headings:* **1. Radio star scintillation . Spread F variations 3. Turbulent wind motion.**—*Author's abstract.*

9.10–169 551.510.535:551.557

Goodwin, G. L. (*Physics Dept. Adelaide Univ. Australia*), **The movements of sporadic-E ayer clouds.** *Journal of Atmospheric and Terrestrial Physics*, London, 11(3/4):177–186, **1957.** figs., table, 10 refs., 5 eqs. **DLC**—An account is given of some measurements of the mag- itude of the drift velocity of isolated sporadic-E clouds, using a C.W. technique. The ethod involves determining the rate of change of phase path of a wave reflected at almost ertical incidence, by measuring the rate of fading of the received signal due to interference etween the reflected and ground waves. A method using two spaced loop-aerials is suggested or determining the direction of drift. Some experimental evidence is described indicating hat the angular spread of scatter from E_s clouds is larger at night than during the day. *Subject Headings:* **1. Sporadic E clouds 2. Sporadic E movement.**—*Author's abstract.*

9.10–170 551.510.535:538.

Pikel'ner, S. B. (*Crimean Astrophysical Obs.*) and Lehnert, B. (*Royal Inst. of Tech., Stockholm*), [**Comments on Lehnert's**] **Magneto-hydrodynamic waves in the ionosphere and their application to giant pulsations.** *Tellus*, Stockholm, 9(1):138–139, Feb. **1957.** eqs. **DLC**—Pikel'ner, in a criticism of Lehnert's paper on magneto hydrodynamic waves in the ionosphere (*see* 8.5–161, April 1957, *MAB*), attempts to show that the coupling between the ions of a neutral gas is too poor for the total mass of the gas to oscillate as a whole in the normal *E*, *F*, and F_2 layers. Lehnert in his reply states that this is true outside the auroral zone but that inside the auroral zone the periods of oscillation of ordinary hydromagnetic waves are consistent with the giant pulsations of 60 to 300 sec if the ionization is high within this region of the giant pulsation. More data are needed. *Subject Headings:* **1. Magneto-hydrodynamic waves 2. Ionospheric waves.**—*M.R.*

9.10–171 551.510.535:551.510.62

Villard, O. G., Jr.; Stein, Sidney and Yeh, K. C. (*all, Radio Propagation Lab., Stanford Univ., Calif.*), **Studies of transequatorial ionospheric propagation by scatter-sounding method.** *Journal of Geophysical Research*, Wash., D. C., 62(3):399–412, Sept. **1957.** 13 figs., 10 refs. **DLC.** Also: Silberstein, R., (**Comments on**) **O. G. Villard, Jr.; S. Stein and K. C. Yeh: Studies of transequatorial ionospheric propagation by the scatter-sounding method.** *Ibid.*, 62(4):645–646, Dec. **1957.** 3 foot-refs. **DLC**—Echoes of exceptionally long delay detected by a HF radar located in the West Indies are interpreted as ground backscatter propagated by two or more successive reflections from the F-region of the ionosphere, without intermediate ground reflection. Propagation of this sort is associated with tilts in the reflecting layers. Pronounced tilts are encountered regularly in equatorial regions; one occurs almost daily at approximately 1900 local time over the geomagnetic equator; another occurs around noon in the vicinity of the subsolar point. It is shown that tilt-supported propagation can take place at frequencies considerably in excess of the MUF predicted in the usual way. It is believed that these results may explain the reports by radio amateurs of anomalous propagation between North and South America. *Subject Headings:* **1. Transequatorial ionospheric radio wave propagation 2. Ionospheric reflection.**—*Authors' abstract.*

9.10–172 551.510.535:621.396

Wait, James R. (*Natl. Bureau of Standards, Boulder, Colo.*), **On the mode theory of V.L.F. ionospheric propagation.** *Geofisica Pura e Applicata*, Rome, 37:103–115, **1957.** 3 figs., 7 refs., 47 eqs. **DLC.** Reprinted as: *U. S. National Bureau of Standards, NBS Report*, 5022, Oct. 10, **1956. DWB**—The space between the earth and the ionosphere is considered as a wave-guide with sharply bounded walls. Employing a representation in terms of spherical wave functions of complex order, the field of a vertical dipole source is calculated for very low frequencies. It is shown that the dominant mode for 16 kc is of order one and not zero as has been commonly supposed. Good agreement is obtained with the experimental results of J. Heritage. *Subject Heading:* **1. VLF propagation.**—*Author's abstract.*

9.10–173 551.510.535:621.396.11

Wheelon, Albert D., **Refractive corrections to scatter propagation.** *Journal of Geophysical Research*, Wash., D. C., 62(3):343–349, Sept. **1957.** 3 figs., 12 refs., 14 eqs. **DLC**—The role played by the ionosphere's mean electron density for scatter propagation is considered. An electron plasma at the scattering point (1) increases the effective wavelength and (2) decreases the scattering angle. These effects combine to modify the basic propagation variable

$$q' = \frac{4\pi}{\lambda} \sin\left(\frac{\theta}{2}\right) \left[1 - \frac{f^2_{MUF}}{f^2}\right]^2$$

by a factor which depends only on the instantaneous maximum usable frequency for the path. Associated signal-level variations are found to be insignificant for conventional VHF scatter links. Such an analysis does provide an explanation for recent observations of F-layer scattered signals and their correlation with f_{MUF}/f. Apparent scattering-height changes caused by

riable refractive pulse delay times are also studied. *Subject Headings:* **1. Ionospheric ectron density 2. Scattering of radio waves.**—*Author's abstract.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **The random universe** (Wehrlé), 9.10–8; **Advective dynamic analysis** (Bodolai), 9.10–138.

9.10–174 551.511:551.521

†Liubimova, E. A., **O roli luchistogo teploobmena v teplovom rezhime Zemli.** [The role radiative heat exchange in the thermal regime of the earth.] *Akademiia Nauk SSSR, vestiia, Ser. Geofiz.*, No. 5:673–676, May **1957.** 2 figs., 20 refs., 3 eqs. **DLC**—Since the rth's crust consists of the substances similar to glass and ceramics it is highly probable at radiant energy heat exchange plays an important role in the transport of heat into the terior of the earth. The role of radiant energy exchange in solid bodies can be evaluated y introducing the coefficient $\lambda = \lambda_1 + \lambda_2$ into the equation of heat conductivity in place of the sual coefficient of heat conductivity. Here λ_2 which stands for radiant energy exchange is qual to:

$$\lambda_2 = \frac{16}{3} \frac{n^2 \sigma T^3}{\theta}.$$

n this paper the author shows that it is impossible to neglect the fall of molecular heat conuctivity with temperature which takes place in the upper layers of earth's crust and hinders considerable removal of heat from the center so that the earth cannot cool rapidly. *Subject Headings:* **1. Radiative exchange 2. Earth's thermal regime.**—*I.L.D.*

9.10–175 551.511.2:533.7

Van Mieghem, J., **Energies potentielle et interne convertibles en énergie cinétique dans atmosphère.** [Potential and internal energy convertible into kinetic energy in the atmosphere.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(1):5–17, **1957.** 4 refs., umerous eqs. German, French and English summaries p. 5. **DWB, DLC**—After some ntroductory remarks on the energy available for conversion into kinetic energy in the atmosphere, various expressions of the available energy are deduced from the classical equations of alance of the potential energy and the internal energy. In these expressions appear the hysical factors responsible for making energy available for conversion into kinetic energy. o this end the classical energy equations are given an appropriate form allowing for the fact at the state of the atmosphere may be considered as being a perturbation of a state of stable quilibrium in the gravity field. Finally, the identity between the equations of balance of e total potential energy and of the available energy is emphasized. *Subject Headings:* **. Kinetic energy in atmosphere 2. Potential energy-kinetic energy conversion.**—*Author's bstract.*

9.10–176 551.511.2:531.65

Wippermann, F., **Die Transformation potentieller und innerer Energie in die Energie otorloser und diejenige divergenzfreier Bewegungen.** [Transformation of potential and nternal energy into vorticity-free and non-divergent motion energies.] *Beiträge zur Physik er Atmosphäre*, Frankfurt a.M., 29(4):269–275, **1957.** 2 refs., 20 eqs. English and French ummaries p. 269. **DWB, DLC.** Trans. into English issued as Germany. Deutscher Wetterienst, Contract AF 61(514)-735-C, Technical Note, No. 5, **1957**(?). Trans. available. **)WB** (M09.312 G373r)—The kinetic energy can be separated (on the average for the whole arth) into two parts, one for the motions without divergence, the other for those without orticity. Balance equations for these two kinds of energy and for the potential and internal nergy are derived. From these equations it is apparent that the internal and potential energy an only be transformed into energy of the motion without vorticity. The latter is then ransformed into energy of motion without divergence. For these three transformations funcions can be given. From these functions the preference of flow with cyclonic shear or curature for such energy transformations can be recognized. *Subject Headings:* **1. Kinetic nergy in atmosphere 2. Energy of motion 3. Energy transformation.**—*Author's abstract.*

General Circulation

9.10–177 551.513:551.58

†Dzerdzeevskiĭ, B. L., **Problema kolebaniĭ obshcheĭ tsirkuliatsii atmosfery i klimata** [Problem of variations in general atmospheric circulation and climate.] (In: Budyko, M. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologii.** Leningrad, 1956. p. 109–122 8 figs., 38 refs.) **DWB**—In view of the short period for which data regarding the genera circulation processes and of the free atmosphere are available it is necessary to combine thes with the variations in the individual climatological elements and to extrapolate the results i studying changes of climate and of the general atmospheric circulation. The description o the general circulation by the use of circulation types and by that of zonal indices are treate On the basis of 55 years (1899–1954) of data on elementary circulation processes, th author examines the relationship between changes in the general circulation and climati change. Running ten year means of deviation of various groups of circulation mechanism (zonal disturbance of zonal and meridional circulation) from the secular mean deviation o secular mean of circulation groups and atmospheric precipitation and air temperature ar analyzed and shown on graphs. *Subject Headings:* **1. General circulation 2. Climatic varia tions.**—*I.L.D.*

9.10–178 551.513:551.55

Starr, Victor P., **The general circulation of the atmosphere.** *Scientific American*, New York, 195(6):40–45, Dec. **1956.** 10 figs. (incl. photos). **DWB, DLC**—The classical theory of the circulation of the atmosphere as formulated by George Hadley is stated. This i followed by a discussion of the attempts of contemporary meteorology to explain the factor producing the prevailing westerly and easterly wind systems with particular reference to th Northern Hemisphere. The actual orientation of air with light air moving downward anc cold air upward cannot supply the energy required for the east-west zonal flow. The theory is proposed that these wind flows receive their energy from cyclonic and anticyclonic eddie and the supporting evidence is summarized. The role of the earth's rotation on weathe formation and the experimental model studies of the atmospheric circulation are discussed The article contains numerous diagrams and is non-technical. *Subject Headings:* **1. Genera circulation 2. Wind systems.**—*I.L.D.*

9.10–179 551.513.1:551.515.7

Kalmykova, N. M., **O formirovanii sibirskogo antitsiklona.** [On the formation of the Siberian anticyclone.] *Meteorologiia i Gidrologiia*, Leningrad, No. 4:20–24, April **1957.** 4 figs., 3 tables, 4 refs., 3 eqs. **DWB, DLC**—Between pressure at the surface and air temperature for points within the Siberian anticyclone there exists a linear relationship expressed by the equation

$$P_0(t) = -aT_0(t) + b,$$

where P_0 and T_0 are the mean annual pressure and temperature, respectively. This relationship was found to hold for 45 points in Asiatic U.S.S.R. for all months except during Sept. and Oct.; the pressure during Sept. being higher than that expected from thermal causes. The formation of the Siberian anticyclone during the cold half of the year begins in Sept. under the influence of circulation conditions. The number of days with the anticyclone in Sept. varies with wide limits since the circulation factor varies from year to year. Four groups of years depending upon the deviations of pressure and temperature have been established: (1) positive anomalies of pressure and positive anomalies of temperature; (2) positive anomalies of pressure and negative anomalies of temperature; (3) negative anomalies of pressure and negative anomalies of temperature; (4) negative anomalies of pressure and positive anomalies of temperature. A numerical relationship was established between synoptic processes in the region of formation of the Siberian anticyclone and the difference in the temperature anomaly between Yeniseisk and Chita. The possibility of using this difference in temperature anomaly for Aug. as an indicator for forecasting formation of the Siberian anticyclone is discussed. *Subject Headings:* **1. Siberian anticyclone 2. Pressure anomalies 3. Temperature anomalies 4. Asiatic U.S.S.R.**—*I.L.D.*

ATMOSPHERIC DISTURBANCES

See also: **Tornado observation, Blackwell, Okla.** (Montgomery), 9.10–106; **Mytymouse Homing System** (Haas et al.), 9.10–119; **Structure of disturbances, Congo Basin** (Jeandidier, Rainteau), 9.10–137; **Typhoon rainfall forecasting** (Fukunaga), 9.10–141; **Siberian anticyclones** (Kalmykova), 9.10–179; **Typhoon damage to rice crops** (Nakagawa, Tsuboi), 9.10–214; **Frontal passage effects on cumulus formation** (Dzhuraev), 9.10–236; **Funnel cloud, Gand** (Maenhout), 9.10–237.

9.10–180 551.515.1:551.553.21(54)

Koteswaram, P. and George, C. A. (*both, Met. Office, Calcutta*), **On the formation of monsoon depressions in the Bay of Bengal.** *Indian Journal of Meteorology and Geophysics*, New Delhi, 9(1):9–22, Jan. 1958. 3 figs., table, 24 refs., 5 eqs. **DWB, DLC**—The role of the upper tropospheric perturbations in the formation of monsoon depressions in the Bay of Bengal has been examined. From a study of these flow patterns, it is found that cyclonic development at sea level occurs when and where an area of positive vorticity advection in the upper troposphere becomes superimposed upon a pre-existing trough at sea level. Other factors affecting cyclogenesis at sea level during the southwest monsoon period are also pointed out. *Subject Headings:* **1. Monsoon depressions 2. Cyclogenesis 3. Bay of Bengal, India.**—*Authors' abstract.*

9.10–181 551.515.11/2:551.242:550.342

Mitra, M., **Rayleigh waves in a multi-layered medium with applications to microseisms.** *Royal Astronomical Society, Monthly Notices, Geophysical Supplement*, 7(6):324–331, Nov. 1957. fig., 2 tables, 14 refs., 13 eqs. **DLC**—An analysis is presented for the propagation of Rayleigh waves in a multi-layered medium with water as the uppermost layer from which it is possible to obtain the group velocity as well as the phase velocity for the Rayleigh waves in an oceanic path with the ocean bed consisting of two upper layers each of uniform composition and finite thickness, underlain by ultrabasic rock extended to large depths. The results have been applied in the analysis of microseisms associated with cyclones and "norwesters." It has been shown that the period of the microseisms recorded at different stations depends critically on the structure of the continental shelf. The results obtained in the present paper, when compared with the nature of the recorded microseisms associated with cyclones, and their variations, give useful information about the depth and structure of the ocean beds. *Subject Headings:* **1. Rayleigh waves 2. Cyclonic microseisms.**—*Author's abstract.*

9.10–182 551.515.2:550.342

Monakhov, F. I. and Baryshnikov, V. B., **K voprosu ob istochnikakh mikroseĭsmicheskikh kolebaniĭ.** [Sources of microseismic oscillations.] *Meteorologiia i Gidrologiia*, No. 4:31–34, April 1956. 3 figs., 7 refs. **DWB, DLC**—Various points of view on the origin of microseisms, in particular that which regards that microseisms arise along cold front cyclones on sea surfaces. The author cites an instance observed on the northwest Pacific where the source of the storm microseisms lagged behind the center of the cyclone. The trajectory of the cyclone and the presumed source of the microseisms are shown on maps. Also, other evidence of this phenomenon is cited. *Subject Headings:* **1. Microseism origin 2. Microseism-cyclone relationships.**—*I.L.D.*

9.10–183 551.515.23

§Spuhler, Walter S. (*U. S. W. B., Wash., D. C.*), **Intensification of a tropical storm at higher latitude: the case of Sept. 14–15, 1904.** *Monthly Weather Review*, Wash., D. C., 85(8):273–278, Aug. 1957. 15 figs., table, 2 refs., eq. **DWB, DLC**—The tropical Low of Sept. 14–15, 1904, is selected as a case for the study of a weak tropical Low intensifying as it moves to higher latitudes. By the use of barograms, thermograms, and autographic wind records, the storm track is reconstructed and hourly surface maps are drawn. The barograms, thermograms, and wind records are combined on single charts for individual stations showing that the increase in winds is associated with the inflow of cold air. The central pressure of the

Low is determined and found to decrease as the Low moves northward. Filling of the Low begins after it moves north of 39.5°N. *Subject Headings:* **1. Tropical low intensification 2. Tropical storm tracks.**—*Author's abstract.*

9.10–184 551.515.3

Gutman, L. N., **Teoreticheskaia model' smercha.** [Theoretical model of a tornado.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 1:79–93, **1957.** table, 11 refs., 67 eqs. **DLC.** Trans. into English by A. K. Henn in the English language edition of the **Izvestiia** *Bulletin of the Academy of Sciences of the U.S.S.R., Geophysics Series*, No. 1:87–103, **1957** issued 1957 by American Geophysical Union. 3 figs., 67 eqs. **DWB**—On the basis of a solution of the nonlinear system of equations of the thermodynamics of the atmosphere, the author develops an idealized model of a tornado as a process produced by the presence of large rotating movements and marked moisture instability in the atmosphere. From this model it is considered that the following conditions must be fulfilled in order that a tornado should develop 1) the atmosphere should be unstable through thickness of 1–2 km; 2) intense storm activity with the formation of vortices with large movements of rotation should take place and 3) that either heat or impulse or kinetic energy sufficiently large to destroy unstable equilibrium should arrive at any point in the atmosphere. *Subject Headings:* **1. Tornado models 2. Tornado dynamics.**—*I.L.D.*

9.10–185 551.515.33

*Tepper, Morris (*U. S. W. B., Wash., D. C.*), **On the evaluation of tornado reports and a numerical method for their classification.** *Monthly Weather Review*, Wash., D. C., 85(5):159–165, May **1957.** 4 figs., 4 tables. **DWB**—Tornado statistics and reports from the U. S. for the period 1916–1956 are examined critically in the light of the evident "explosive" increase in the number of tornadoes since 1948. The tornado deaths for the same period of years do not bear out this increase since 1948. Hence it is supposed that more accurate and detailed reporting of tornadoes, or even reporting of many small funnel clouds or severe storms that would not have been reported previously is responsible. This began with the establishment of SELS and other tornado observing and forecasting networks. A method of reducing this bias so recent statistics are comparable with earlier data is outlined and illustrated. *Subject Headings:* **1. Tornado statistics 2. Tornado report homogeneity 3. United States.**—*M.R.*

9.10–186 551.515.8

Kurooka, H. (*Tokyo Internat. Airport Weather Serv., Tokyo*), **Modification of Siberian air mass caused by flowing out over the open sea surface of northern Japan.** *Meteorological Society of Japan, Tokyo, Journal*, Ser. 2, 35(1):52–59, Feb. **1957.** 10 figs., 12 refs., 8 eqs. **DWB, DLC**—The transformation of the cP air mass into the mP air mass due to upward heat and moisture supplies from the warmer sea surface around Japan is investigated. Keeping aloof from treating the transfer processes theoretically, available measured data are utilized for evaluating the modification processes and constructing a lower atmospheric cross section following the air column throughout the whole modified layers. The results are almost the same as those of former investigations obtained theoretically with little addition to be made. But this report will serve to verify those results with the actually observed information and to present some simple clue to the forecasting of the cloud and the snowfall. *Subject Headings:* **1. Air mass modification 2. Polar continental air masses 3. Air flow over the sea 4. Japan.**—*Author's abstract.*

9.10–187 551.515.8:551.509.31

§Tschirhart, G., **Étude de l'évolution particulière d'une masse d'air.** [Study of an unusual development of an air mass.] *La Météorologie*, Paris, Ser. 4, No. 43:243–258, July/Sept. **1956.** 11 figs. French, English and Spanish summaries p. 243. **DWB**—The synoptic situation in N.W. Africa from Feb. 15–22, 1954 is analyzed by means of synoptic surface and 700 mb charts, climatological data (precipitation, temperature and dew point), upper air soundings (temperature, potential temperature and dew point for Niamey) and recorder records (temperature). The occurrence of precipitation and thunderstorms at this season

n the Lake Tchad region is extremely rare. Hence the development of this frontal disturbance s of exceptional interest. It is shown that the front or disturbance is evident at higher levels ut not as a surface warm or cold front since the surface topography and heating destroy the harp boundary at its intersection with the ground. The mass of humid air aloft is the best ndication of the warm sector ahead of the cold front. *Subject Headings:* **1. Synoptic case istories 2. Frontal disturbances 3. Northwest Africa 4. Lake Tchad Region, French quatorial Africa.**—*M.R.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Mie scattering and refractive index** (Penndorf, Goldberg), 9.10–4; **Arctic micromet., Alaska** (Church), 9.10–51; **Solar energy utilization** (Mathur, Khanna), 9.10–102; **Solar radiation, Darwin** (Albrecht), 9.10–107; **Smoke pall, London** (Currie), 9.10–159; **Absorption of solar radiation by atmos. ozone** (Adel), 9.10–163; **Solar radiation and nuclei production** (Verzàr, Kunz), 9.10–230; **Insolation near wind breaks** (Sato), 9.10–280; **Auroral luminosity** (Morel-Viard), 9.10–305.

9.10–188 551.521.1

Elnesr, M. K., **Contribution à l'étude de l'énergie solaire en Égypte.** [Solar energy in Egypt.] *Journal Scientifique de la Météorologie*, Paris, 8(32):133–146, Oct./Dec. **1956.** 4 figs., 5 tables, 6 refs. French, English and Spanish summaries p. 133. **DLC**—At Helouan Observatory, Egypt, solar radiation intensity has been measured on cloudless days by means of an Ångström pyrheliometer since 1914. On the basis of these measurements the author presents tabular and graphical data on monthly intensity values for different air masses and solar angles, diurnal variations of global and diffuse (clear sky) radiation, and radiation amounts received on surfaces of different orientation. *Subject Headings:* **1. Solar radiation 2. Radiation intensities 3. Egypt.**—*G.T.*

9.10–189 551.521.11

Steinhauser, F. (*Vienna*), **Karten der Sonnenscheindauer in Österreich in den einzelnen Jahreszeiten.** [Seasonal maps of sunshine duration in Austria.] *Wetter und Leben*, Vienna, 7(8/11):277–278, **1955.** **DLC**—A description is given of the seasonal insolation maps of Austria which give relative sunshine duration. Isolines of 5% effective solar radiation are entered on the maps. *Subject Headings:* **1. Sunshine duration 2. Austria.**—*I.L.D.*

9.10–190 551.521.11

Steinhauser, F. (Vienna), **Über die kartographische Darstellung der Sonnenscheindauer.** [Cartographic representation of sunshine duration.] *Wetter und Leben*, Vienna, 8(1/2):1–12, **1956.** 3 figs., table, 13 refs. English summary p. 1. **DLC**—Various methods for representing the duration of sunshine cartographically are discussed and it is concluded that the best results are obtained by using percent of actually possible duration or relative sunshine duration. It is a value that enables a uniform estimate of the annual variation of the variable and the calculation of the actual sunshine duration. This method was used to construct summer, winter and annual sunshine duration (1928–1950) maps for Austria. These charts together with a table giving the annual variation of relative sunshine duration (%) and the average daily sunshine hours for various stations in Austria are presented. The author points out the inadequacy for cartographic representation of sunshine duration by means of average daily, monthly or annual totals of sunshine duration as the percent of astronomically possible sunshine duration. *Subject Headings:* **1. Sunshine duration 2. Annual sunshine duration variations 3. Austria.**—*I.L.D.*

9.10–191 551.521.12:551.508.21

*Zingg, Th. (*Inst. Fédéral pour l'Étude de la Neige, Davos*), **Strahlungsmessungen mit dem Bellani Kugelpyranometer auf Weissfluhjoch in 2670 m. ü. M.** [Radiation measurements on

Weissfluhjoch at 2670 m with a Bellani spherical pyranometer.] *La Météorologie*, Pari Ser. 4, No. 45/46:325–327, Jan./June **1957.** 3 figs. German, French and English summari p. 325. **DWB**—The results of measurements with and without snow cover are reported an compared with observations at Basel (270 m). Good agreement was found between radiatic values recorded at both stations in the absence of snow, while the values were 4 times greate with snow and sunshine durations from 0–3 hr and showed a great range of variations. Value obtained with the Robitzsch actinograph were 12–15% greater with snow than without i The variations of the Bellani instrument are attributable to its great sensitivity to changin albedo conditions. *Subject Headings:* **1. Solar radiation measurements 2. Bellani pyra nometer. I. International Congress of Alpine Meteorology. 4th, Chamonix, September 195** —*SIPRE abstract.*

9.10–192 551.521.

Malkevich, M. S., **Ob uchete neodnorodnosteĭ podstilaiushcheĭ poverkhnosti v zadachak rasseianiia sveta v atmosfere.** [Calculating the non-uniformity of an underlying surface i problems of light scattering in the atmosphere.] *Akademiia Nauk SSSR, Izvestiia, Ser Geofiz.*, No. 5:628–643, May **1957.** 9 refs., 32 eqs. **DLC**—The intensity and flux of radiatio in the atmosphere are determined on the assumption of a nonhomogeneous reflecting surfac along one of the horizontal coordinates and isotropic scattering by the medium. In orde to compute the effect of the nonhomogeneous reflection of the surface upon the light regim of the atmosphere, it is sufficient to determine the system of universal functions, which ar obtained by solving independent integral equations with some transcendental nuclei result ing from a generalization of Gold's function. Several qualitative expressions obtained fo the general form of the situations are presented. *Subject Headings:* **1. Atmospheric scatter ing 2. Albedo of atmosphere.**—*Trans. of author's abstract* (*I.L.D.*).

9.10–193 551.521.

Timofeeva, V. A., **Zavisimest' mezhdu koeffitsientom rasseianiia napravlennogo svetovog potoka i koeffitsientom oslableniia predel'no rasseiannogo svetae v mutnykh sredakh.** [Rela tion between the scattering coefficient of a direction beam and coefficient of extinction o diffuse radiation in turbid media.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 2:265 272, **1957.** 8 figs., 3 refs., 8 eqs. **DLC.** Trans. by R. Y. Zatorski from original Russia into English in English language ed. of the **Izvestiia,** *Bulletin of the Academy of Science of the U.S.S.R., Geophysics Series*, No. 2:152–159, **1957.** 8 figs., etc. **DWB**—The purpos of this study is to establish a relationship between the coefficients of extinction of direc $(k+m)$ and diffuse (k') light beams in such turbid media in which it is already impossible t neglect the coefficient of absorption in comparison with the coefficient of diffusion, and t determine the dependence between the magnitude of the parameter A and the coefficient o extinction. With the aid of photographs the apparatus for determining the magnitude k in a comparatively small amount of medium and with artificial illumination is described The results of the investigations (data presented in graphs) show that the relation k', $k+m$ can be expressed in a general form by $K' = [^{-}A(k+m)]\sigma$ as σ depends upon the magnitud of the coefficient of extinction m. *Subject Headings:* **1. Extinction coefficient of diffusion 2. Scattering coefficient 3. Diffuse radiation.**—*I.L.D.*

9.10–194 551.521.63

Lopukhin, E. A., **Intensivnost' ul'trafioletovoĭ radiatsii v Tashkente.** [Intensity o ultraviolet radiation at Tashkent.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:32–35 Jan. **1956.** 2 figs., 4 tables, refs., 2 eqs. **DWB, DLC**—This paper contains a discussion o and data on the intensity of total ultraviolet radiation (presented in isolines) variations o the ratio of diffuse to total radiation in the 350–410 mμ region as a function of solar altitude on clear days, dependence of ultraviolet radiation on solar altitude, mean monthly intensity of direct ultraviolet radiation upon a perpendicular horizontal surface in the 295–350 mμ regions, etc. *Subject Headings:* **1. Ultraviolet radiation intensities 2. Tashkent, U.S.S.R.** —*I.L.D.*

TEMPERATURE

See also: **Record low temps., South Pole** (Flowers), 9.10–56; **Persimmon field temp.** (Kaneseki), 9.10–94; **Temp.-crop distribution limits, N. and S. Hemispheres** (Nishiuchi), 9.10–95; **Phenological temp. computations** (Lindsey, Newman), 9.10–113; **Cloudiness effects on temp.** (Kozakov), 9.10–239; **Micromet. temp. data** (Maruyama, Yamamoto), 9.10–278; **Indoor temps.** (Akai), 9.10–281; **Frost data, Wisconsin** (Wang, Suonii), 9.10–292.

9.10–195 551.524.1

Krechmer, S. I., **Eksperimental'noe opredelenie kharakteristik temperaturnykh pul'satsiĭ v atmosfere.** [Experimental determination of temperature characteristics of pulsation in the atmosphere.] *Moscow. Tsentral'naia Aerologicheskaia Observatoriia, Trudy*, No. 16:39–47, **1956.** 9 refs., 6 figs. **DLC**—Methods and results of a processing of recordings of the temperature field microstructure obtained in summer 1953 at the field station of the Geophysical Institute in the Bronnitskiĭ region, Moscow Oblast, with the aid of micrometers designed by the author, registering on photopaper temperature pulsations, or temperature differences, with a sensitivity of the order of .01°C per 1 mm, and an inertia of a hundredth part of a second (order) are presented. *Subject Headings:* **1. Temperature microvariations 2. Bronnitskiĭ Region, U.S.S.R.**—*A.M.P.*

9.10–196 551.524.3

Kurdina, T. N., **K analizu srednedekadnykh temperatur vody v Rybinskom vodokhranilishche.** [Analysis of mean decadal water temperatures in the Rybinsk reservoir.] *Meteorologiia i Gidrologiia*, No. 8:40–42, Aug. **1956.** 3 figs., 2 tables. **DWB, DLC**—An analysis of the mean decadal water temperature during 1954–1955 at the Rybinsk reservoir indicated that the course of the water temperature at one of the temperature measuring stations deviated from the water temperature at the other stations and from the course of the air temperature. The relationship between these temperature deviations and the prevailing wind during their occurrence is presented. *Subject Headings:* **1. Mean decadal water temperature variations 2. Water temperature deviations 3. Rybinsk reservoir, U.S.S.R.**—*I.L.D.*

9.10–197 551.524.33/34:551.509.314

Sneyers, R., **Connexions thermiques entre saisons consécutives à Bruxelles-Uccle.** [Thermal connections between consecutive seasons at Brussels-Uccle.] *Belgium. Institut Royal Météorologique, Publications*, Ser. B, No. 23, **1958.** 23 p. 4 figs., 6 tables, 10 refs. Also in: *Ciel et Terre*, Brussels, 74(3/4):216–236, March/April **1958.** 5 figs., table, 10 refs. **DLC**—The air temperature at Uccle has increased during all four seasons. This change of climate is an indisputable reality in this region, and its existence is sufficient to explain the appearance of thermal connections between consecutive seasons. The increase of frequency of abnormally warm seasons is the main manifestation of this fact. *Subject Headings:* **1. Temperature trends 2. Secular temperature variations 3. Thermal connections between seasons 4. Uccle, Belgium.**—*A.V.*

9.10–198 551.524.35

§Bayer, Karel (*Geophys. Inst., Czechoslovak Acad. of Science*), **Vánoční oblevy v období 1905–1954.** [Christmas thaws, 1905–1954.] *Meteorologické Zprávy*, Prague, 9(1):8–15, **1956.** 9 figs., 8 tables, 11 refs. Russian and German summaries p. 8. **DWB**—Interdiurnal variability of daily maximum temperature at Milešovka in the second half of Dec. is analyzed for the periods 1905–1920, 1922–1938 and 1945–1954. Out of the 43 years investigated there was a "warming" in 41 cases and thawing (non-freezing) weather in 29 cases, around Christmas. An index of cyclone occurrence for a given area on a given day over a number of years is introduced; it consists of the difference between the number of cyclone and anticyclone centers. Isolines of cyclone occurrence index numbers for 43 years are drawn on five maps (two days preceding the warm spell and first three days of the warm spell) and the synoptic situation during the Christmas "warming" is determined and frequencies of prevailing synoptic types are computed. *Subject Headings:* **1. Temperature singularities 2. Christmas thaws 3. Milešovka, Czechoslovakia.**—*Trans. of Author's abstract.*

9.10–199 551.524.4:551.526.6

Bunker, A. F. (*Woods Hole Oceanog. Inst.*), **Measurements of counter-gradient heat flows in the atmosphere.** *Australian Journal of Physics*, Melbourne, 9(1):133–143, March **1956.** 2 figs., 3 tables, 9 refs., 8 eqs. **DLC**—Heat flows and temperature gradients were measured in a stable atmosphere heated by the water during a United States east coast to Bermuda aeroplane flight. The flux was computed from $c_p \rho \overline{w'T'}$, where w' and T' are the vertical velocities and temperature deviations of the individual gusts. It is found that the heat flow is directed up the gradient as predicted by PRIESTLEY (1954). The expression for the maximum heat flow to be expected derived by PRIESTLEY in terms of the standard deviation of the temperature fluctuations and the temperature gradient gives the correct order of magnitude for the observed flow. *Subject Headings:* **1. Energy exchange sea-atmosphere 2. Airplane heat flux measurement 3. New England-Bermuda air-route.**—*Author's abstract.*

9.10–200 551.524.7:551.510.52

Antonov, V. S. and Makhover, Z. M., **Chto otobrazhaiut karty izoterm na urovne poverkhnosti 500 mb.** [What isotherm charts at the 500 mb surface show.] *Meteorologiia i Gidrologiia*, No. 9:32, Sept. **1956.** ref. **DWB, DLC**—The authors present some statistical data relating to the properties of the isotherm field at 500 mb on the basis of radiosonde observations made at Kursk and Tambor in 1952. In 93% of the cases the mean temperature of the troposphere coincided with the layer between 500 and 400 mb. In 1% of the cases the mean temperature of the troposphere was above that at the 400 mb level. In 6% of the cases it was below the temperature at 500 mb since observations were made in winter. *Subject Headings:* **1. Isothermal analysis 2. Tropospheric temperatures.**—*I.L.D.*

SOIL TEMPERATURE

9.10–201 551.525.2:551.584.41:551.588.2

†Shanks, Royal E. (*Univ. of Tennessee*), **Altitudinal and microclimatic relationships of soil temperature under natural vegetation.** *Ecology*, Durham, N. C., 37(1):1–7, Jan. **1956.** 8 figs., 2 tables, 17 refs. **DWB, DLC**—Under the weather conditions prevalent in the Great Smoky Mountains and in the southern Appalachians and within the closed forest types generally characteristic of the region, soil temperatures from six in. depths measured with a dial-type metallic thermometer at weekly intervals provide a useful index to altitudinal and microclimatic temperature differences. The soil temperatures correlate more closely than the means of weekly maximum and minimum air temperatures with standard weather record means and they constitute a useful integration of radiation and air temperature conditions during the preceding week. An evaluation of the instruments showed that the metallic thermometer was as reliable as the standard mercury in glass thermometer. The degree of precision was adequate to reveal microclimatic differences between adjacent habitats which differed in vegetation. *Subject Headings:* **1. Soil temperature in forests 2. Forest microclimatology 3. Altitude effects on soil temperatures 4. Great Smoky Mountains 5. Appalachian Mountains.**—*Based on author's summary* (*I.L.D.*).

9.10–202 551.525.5

*Mosienko, N. A., **Promerzanie i ottaivanie pochvy v usloviiakh kulundinskoĭ stepi.** [Freezing and thawing of the soil under conditions prevailing in the Kulundinskaia Steppe.] *Pochvovedenie*, Moscow, No. 1:45–51, **1957.** 6 tables, 8 refs. English summary p. 51. **DLC**—Article gives data resulting from 3 years (1953–56) of systematic research on freezing and thawing depth of soil in the Kulundinskaia Steppe (Rodinsk Region, Altai). Depth of freezing depends on thickness of snow cover. With thick snow cover, freezing extended to 65 cm with thin layer of snow to 237 cm. In shelter belts, freezing never went below 72 cm and averaged 62 cm. Greatest depth was at end of March or first of April. Thawing starts from above after snow disappears. Permeability (to water) and migration of water upwards in winter were also measured and data presented in tables. Coefficient of surface runoff is also discussed and data presented. *Subject Headings:* **1. Soil freezing data 2. Soil thawing data 3. Kulundinskaia Steppe, Altai Region, U.S.S.R. (Asiatic).**—*M.R.*

WATER TEMPERATURE

See also: **Energy exchange sea-atmosphere** (Bunker), 9.10–199.

9.10–203 551.526.8(52)

Kubo, T., **Daily and seasonal variations of water temperature and pH in the Tone River. Japan.** *Meteorological Agency, Tokyo, Memoirs of Industrial Meteorology*, 20(2):51–66, Jan. 1957. 6+figs., 3 tables, 2 refs. In Japanese; English summary p. 65–66.—Observations are made every month on the water temperature and the hydrogen ion concentration (determined by calorimetric method) at four selected stations (Minakami, Shibukawa, Maebashi and Kawamata in Gunma Prefecture) along the channel of the River Tone. The author has studied the characteristics of the daily, seasonal and sectional variations, and some interesting facts are found as follows: a) Amplitude of annual temperature variation amounts to 22°C minimum value being 3°C in Jan., and maximum value 25.4°C in Aug.; b) pH varies from the lowest value of 4.2 to the highest value of 6.9 in the year, and shows large fluctuations during rainy days, due to the drainage from the Agatsuma River, one of the affluents of the Tone River, which is famous for its acidity; but usually the effects of acidity are dissipated in the lower reaches of the Tone more than 50 km distant from the junction; c) Usually the water temperature rises gradually at the rate of 1°C/10 km (in winter, 0.5°C/10 km) in the course of flowing down to the lower reaches; d) Temperature distribution of the channel sections (the water depth is always 1–2 m) shows no contrast in the vertical direction, but in the horizontal direction the water temperature in the central, deep and high-speed parts of the river is 0.1 to 0.2°C lower than in the coastal, shallow and low-speed parts; e) Usually, the highest and lowest water temperatures are observed at 16 to 18h and 6 to 8h, respectively, and its daily amplitude amounts, in general, to 1 to 2°C, excepting 3.1°C in May; f) Water surface level shows pronounced daily changes of about 30 cm (in maximum), resulting to the pH-value fluctuations, but the causes are unaccountable by means of our data only. *Subject Headings:* 1. **River temperature variations 2. pH content of rivers 3. Tone River, Gunma Prefecture, Japan.**—*Author's abstract.*

PRESSURE AND WIND

PRESSURE

See also: **Minimum flight path computers** (Moll), 9.10–93; **Equatorial circulation** (Fortak), 9.10–218.

9.10–204 551.543.1

Fujimura, I., **On the diurnal change of air pressure.** *Journal of Meteorological Research*, Tokyo, 8(11):689–706, Dec. 1956. 12 figs., 4 tables, 26 refs., 12 eqs. In Japanese; English summary p. 689. **DWB, DLC**—In this report, the diurnal change of air pressure resulting from thermal and dynamical effect was examined. The thermal diurnal changes of air pressure $\triangle p$ is given by the following expression:

$$\triangle p = c\frac{\partial^2\theta(t)}{\partial t^2} = 2c\beta\theta_0\{2\beta(t-13)^2-1\}e-\beta(t-13)^2,$$

and the dynamical diurnal change of air pressure $\Delta\pi$ is given by

$$\Delta\pi = m\frac{5g^5}{RT}\int^{\infty} dz + n(\Delta p)n(\Delta p)n = -e\{pu\Delta(t)n, \qquad (0<m<1,\ 0<n<1),$$

where c is a constant, θt the air temperature, θ_0 the maximum temperature, β a constant and e the Napier's constant. g, R, T, p and u are the acceleration of gravity, gas constant, absolute temperature, density and wind velocity, respectively. And $(\Delta p)\theta$ represent the dynamical effect at altitude n resulting from wind velocity. *Subject Heading* 1. **Diurnal pressure variations.**—*Author's abstract.*

9.10–205 551.547.1:551.509.317

Wilson, H. P., **The estimation of 1000–500 mb thicknesses.** *Canada. Meteorological Division, CIR.* 2769, TEC. 231, March 28, **1956.** 6 p. table. **DLC**—For checking 1000–500 mb thickness values in Canada, a test was made of the relation between these values and the 500 mb temp. If the data are divided into 3 categories—Maritime, Intermediate and Continental, useful indexes can be developed. These indexes are presented and discussed. *Subject Headings:* **1. Thickness charts (500–1000 mb) 2. 500 mb temperature.**—*M.R.*

9.10–206 551.547.2

Maksič, Branko, **Jedna metoda redukcije tlaka zraka na morsku razinu.** [A method of atmospheric pressure reduction to sea level.] *Jugoslavenska Akademija Znanosti i umjetnosti, Zagreb, Rad,* 302:113–135, **1956.** 2 figs., table, 11 refs., numerous eqs. Reprinted as: *Zagreb Sveučilište. Geofizički Institut, Reprint,* No. 1. **DWB**—A formula is developed for reduction to sea-level pressure. If pressures at two neighboring stations with considerable difference in altitude are known, the pressure reduction can be calculated for all surrounding stations. The parameters used in the formulas are difference between geopotentials of the two levels, and virtual temperature. As an example the formula is applied to the stations Zagreb-Grič (162.6 gpm) and Sljeme (1016.6 gpm). *Subject Headings:* **1. Pressure reduction 2. Zagreb-Grič, Yugoslavia.**—*G.T.*

WIND AND TURBULENCE

See also: **Waving plant phenomena caused by wind** (Inoue), 9.10–208 to 9.10–211.

9.10–207 551.551:551.510.42:533.16

Gillespie, T. and Gunter, A. W., **The drag on spheres and cylinders in a stream of dust-laden air.** *Canada. Suffield Experimental Station, Ralston, Alberta, Suffield Technical Paper,* No. 114, Feb. 12, **1957.** 4 p. 9 figs., 5 refs. **DWB** (M055 C212s)—A system has been developed for measuring the drag on small spheres and cylinders in a stream of dust-laden air. The drag was found to be proportional to the kinetic energy of the dust plus the kinetic energy of the air, and to be independent of particle size for particles having diameters in the range 50μ to 400μ. The drag coefficient is determined using the Reynold's number for air alone, indicating that the dust has little effect on the flow pattern. The results indicate that an instrument utilizing the drag principle to measure dust concentration could be developed. *Subject Headings:* **1. Drag coefficient of dust 2. Dust-laden air 3. Dust content of air.**—*Authors' abstract.*

9.10–208 551.551:633.1

Inoue, E. (*Natl. Inst. of Agric. Sci., Div. of Met.*), **Mechanism and characteristics of waving plants phenomena (Studies of the phenomena of waving plants (Honami) caused by the wind, Pt. 1).** *Journal of Agricultural Meteorology,* Tokyo, 11(1):18–22, July **1955.** 2 figs., 2 tables, 14 refs., 4 eqs. In Japanese; English summary p. 22. **DWB**—A number of wind velocity profiles over a rice field obtained during the summer season under a nearly adiabatic condition are represented by the logarithmic law, i.e.,

$$U(z) = \frac{2.303}{k} V_* \log \frac{z-d}{z_0}, \qquad z > d+z_0;$$

where k, V^*, d and z_0 have their usual meanings, respectively. The zero-plane displacement d is shown to have a maximum value at a certain critical wind velocity; and z_0 and, consequently, the surface drag coefficient C_s are shown to attain minimum simultaneously at the same critical. These behaviors are related to predominance of the waving rice phenomena, whose period and amplitude are explained respectively by length and energy of the coupling turbulon in surface wind. The period of waving plants is computed as a passage time of coupling turbulon depending upon d and wind velocity, and is found at the critical velocity (ca. 5.5 m/sec at 2 m height) to coincide with the natural period of vibrating rice (ca. 1 sec). This coincidence is maintained even in the range of wind velocity over the critical value and to which the predominance of waving plants phenomena is attributed. Preliminary observa-

ons made by SUZUKI (1948) are shown in accord well with the present considerations. *Subject headings:* **1. Wind velocity profiles 2. Rice paddies 3. Waving plant phenomena.**—*Author's abstract.*

9.10–209 551.551:633.1

Inoue, E. (*Natl. Inst. of Agric. Sci., Div. of Met.*), **Spectra of waving plants and plants vibration. (Studies of the phenomena of waving plants "HONAMI" caused by wind, Pt. 2).** *Journal of Agricultural Meteorology*, Tokyo, 11(3):87–90, Dec. **1955.** 5 refs., 10 eqs. In Japanese; English summary p. 90. **DWB**—Phenomena of waving plants and vibration of individual plant are regarded to be both caused by behaviors of turbulons contained in the surface wind just at the plant's height. Turbulons are divided into two classes of the coupling fictional ones and the larger ones. The former is further subdivided into the predominant corresponding to the earlier mixing length concept, the intermediate to which the well known second similarity hypothesis of turbulence is applicable and the smallest to which the first similarity hypothesis is applicable. The predominant turbulon is fed energy from the shearing mean wind field and simultaneously provides the same amount of energy to the intermediate, and the energy distribution among the intermediate turbulons is represented by the so-called 5/3 power law of the turbulon energy spectra. The Lagrangian description of turbulon spectrum is applied to the waving plants phenomena, in which the progressing plants waving is compared to the non-lift balloons floating over the plants, and the Lagrangian spectrum of turbulence is presented as

$$F(n/n_0) = \frac{2}{\pi} \frac{1}{1+(n/n_0)^2},$$

where n denotes the life-frequency of turbulon and n_0 does approximately that of the predominant turbulon and/or waving plants. The life-time of the predominant waving plants over rice fields is estimated to decrease with increasing wind velocity and to attain a constant value of about 1.5 sec at and beyond the critical wind velocity (over ca. 5.5 m/sec at 2 m height). The vibration of individual plants is regarded to be due to the successive passage of turbulons of the surface wind. Since under a condition of wind velocity below the critical fluctuations of displacement (or the amplitude of plant vibration) is represented in terms of the wind force or wind pressure fluctuations, the spectral function of wind pressure fluctuations is suggested to be applicable to the plant's vibration as follows:

$$F(N/N_0) = \frac{20}{9} \frac{(N/N_0)^3}{\{1+(N/N_0)^2\}^{8/6}},$$

where N_0 corresponds approximately to the passage-frequency of the predominant turbulon. The plants vibration is divided also into the predominant, the intermediate and the smallest vibration. The smallest vibration is considered to be caused by turbulons of the passage-time just same as the period of natural vibration of plants. At and beyond the critical wind velocity, periods of the predominant and of the smallest vibration coincide with each other and the above spectral function cannot be applied, but the line spectrum of vibration is expected to predominate at the period of natural vibration of plants. No practical observations have yet been available to be compared to the theoretical results. *Subject Headings:* **1. Waving plant phenomena 2. Turbulence spectrum 3. Surface winds 4. Rice paddies.**—*Author's abstract.*

9.10–210 551.551:633.1

Inoue, E. (*Nat. Institute of Agri. Sciences, Div. of Met.*), **Turbulent diffusion phenomena over the waving plants (Studies of the phenomena of waving plants "Honami," caused by wind, Pt. 3).** *Journal of Agricultural Meteorology*, Tokyo, 11(4):147–151; March **1956.** 2 figs. table, 9 refs., 17 eqs. In Japanese; English summary, p. 151. **DWB**—Making use of the information about the characteristics both geometrical and dynamical of the predominant turbulons which give rise to waving plant phenomena ("HONAMI") over cultivated fields such as rice and wheat, several turbulent diffusion phenomena of particles such as smoke and agricultural chemicals over these fields are theoretically dealt with. The scale Λ and the velocity V of the predominant or the coupling turbulon are related to the measuring height,

the zeroplane displacement, the roughness parameter and the mean wind velocity. T
parameters characterizing the turbulent diffusion phenomena are introduced as the life-ti
$\tau = \Lambda/V$ and the turbulent diffusion coefficient $K = \Lambda V = \tau V^2$. The dependence of these t
parameters upon the mean wind velocity is considered, in particular being taken the dependen
of both Λ and V upon the mean wind velocity into account, and it is made clear that t
diffusion starts to predominate at the critical wind velocity of the waving plants phenome
Three dimensional scales of the predominant turbulon are considered and the remarkal
differences in the life-times of predominant turbulon with respect to the directions, longitudin
transversal and vertical, are pointed out. In particular, the longitudinal life-time is sho
to be nearly eight times those in other two directions. One of the earlier results of smoke p
experiments extended over sea surface is made use of being compared to this theoretical anti
pation, in which the longitudinal elongation of smoke puff is much predominant and the r
of elongation is in accord with the theoretical result based on the modern similarity hypothes
i.e., the length of smoke puff increases in proportion to the three-halves power of the diffusi
time. The contributions of larger scale turbulons besides those of the coupling turbulons a
dealt with, too. The scale Λ_l and the velocity V_l of the larger turbulon are shown both
proportion to the wind velocity at the measuring height. Near the ground surface usua
the life-time τ_l of larger turbulon is shown independent of the height and much larger than t
life-time τ of coupling turbulon. The meandering phenomenon of a smoke plume is attribut
to the occasional contribution of these larger scale turbulons. *Subject Headings:* **1. Wavi
plant phenomena 2. Turbulent diffusion 3. Rice paddies.**—*Author's abstract.*

9.10–211 551.551:551.5

Inoue, Eiichi; Tani, N. and Imai, K. (*all, National Institute of Agricultural Science*
Some measurements of wind over the cultivated field, Pt. 4. *Journal of Agricultural Meteo
ology*, Tokyo, 11(2):44–48, Oct. **1955.** 2 figs., 3 tables, 9 refs., 18 eqs. In Japanese; Engli
summary p. 48. **DWB**—In order to describe reasonably the turbulent characteristics of wi
velocity fluctuations near the surface of cultivated field, the empirical turbulent energy spect
are introduced as follows:

$$F_u(N/N_{0u}) = \frac{2}{3}\frac{N/N_{0u}}{\{1+(N/N_{0u})^2\}^{4/3}} \quad \text{and} \quad F_w(N/N_{0w}) = \frac{2}{3}\frac{N/N_{0w}}{\{1+(N/N_{0w})^2\}^{4/3}},$$

where N denotes the passage-frequency of turbulon, and N_{0u} and N_{0w} do those of the large
(or coupling) turbulon for u- and w-component, respectively. These spectra represent t
$-5/3$ power relation at large N and the 1 power at small N. By means of the partial integr
tion and the Fourier transform of the above spectra, the influence of the change in averagi
procedure on the observed turbulent energy and the functional form of the Eulerian correlati
coefficient of velocity fluctuations in particular for the range of not necessarily small proce
time t, are obtained. These theoretical results are compared to those obtained in practic
observations reported in the last paper (part 3) of the same authors, and the particular cha
acteristics of the latter are shown to be explained as follows: (1) When the averaging-time T
is sufficiently larger than the passage-time of the largest turbulon, the change in T_* does n
cause any remarkable increase in $\langle u'^2 \rangle$, whereas when T_* is sufficiently smaller than the passag
time of the largest turbulon, $\langle u'^2 \rangle$ increases with $T_*^{2/3}$. (2) When the averaging-time is t
much large compared to the passage-time of the largest turbulon, sometimes the contributio
of the larger-scale turbulons caused topographically, geographically, thermally and so o
to the observed turbulent energy $\langle u'^2 \rangle$ predominate. These contributions seem to cause t
vertical gustiness distribution independent of height, and to give rise to the result of $\langle u'^2 \rangle$
$=$const. $U(z) =$const. log $(z-d)$, where z, d and $U(z)$ mean the observation height, the zer
plane displacement and the mean wind velocity at the height z, respectively. Howeve
according to the conditions whether the former be sufficiently smaller than the latter or be
the just same order, the vertical gustiness distribution increases with or independent of t
height. Therefore, any simple empirical laws of gustiness distribution seem difficult to
universal. (3) In order to obtain the Eulerian correlation coefficient corresponding to t
well-known form of $R(t) = 1 -$const. $t^{2/3}$, the process-time t is much smaller than the passag
time of the largest turbulon. However, when the former is much larger than the latter, t

nctional form of $R(t)$ is rather approximated fairly well by $1-\text{const.}\ t^{1/3}$, where $R(t)\leq 0.4$.) The practically observed results seem to suggest that the passage-time of the largest tur- ulon is almost given by $10(z-d)/U(z)$. The characteristic time $T_*\equiv(z-d)/U(z)$ is tentatively alled the equivalent passage-time of wind at the height z. Furthermore, making use of these sults, the necessary response time ${}_*T$ of the anemometer and the necessary length T_* of veraging time for the measurement of the intermediate turbulon range (or the inertial sub- nge) are suggested to be given by ${}_*T=(z-d)/U(z)$ and $T_*=100(z-d)/U(z)$, respectively. For Pt. 1, *see* 5.2–164; Pt. 2, *see* 7.6–160; Pt. 3, *see* 8.3–234. *Subject Headings:* **1. Vertical ind velocity distribution 2. Turbulence spectrum 3. Rice paddies.**—*Authors' abstract.*

WIND VARIATIONS AND SPECIAL WINDS

See also: **Squall lines, Belgian Congo** (Jeandidier, Rainteau), 9.10–137; **Monsoon depressions** (Koteswaram, George), 9.10–180.

9.10–212 551.553.21

Khromov, S. P., **Geograficheskoe rasprostranenie mussonov.** [Geographical distribution f monsoons.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia,* 89(1):7–13, an./Feb. **1957.** fig., 14 refs. Trans. by H. Lange into German with title: **Die Geographische Verbreitung der Monsune** appeared in *Petermanns Geographische Mitteilungen,* 101(3):234–237, **957.** fig., 14 refs. **DLC**—In agreement with FLOHN, monsoons are regarded as including ll seasonal displacements of planetary wind zones, and rain as cyclonic frontal rainfall. The Etesians are a dry summer monsoon. Map shows areas with over 60, 60–40 and below 40% f winds in Jan. and July from same octant. The monsoon zones include Arctic basin but reatest extent is in Indian Ocean region of tropics. Temperate monsoon zone includes Eurasia along 50°N between Volga and Transbaikal, in the Far East, and along S coast of Alaska in 60°N; all these are due to seasonal shifts of subtropical anticyclones. *Subject Heading:* **1. Monsoon distributions.**—*C.E.P.B.*

9.10–213 551.554:633.1

Tani, N.; Inoue, E. and Imai, K. (*all, Natl. Inst. of Agric. Sci.*), **Some measurements of wind over the cultivated field, Pt. 5.** *Journal of Agricultural Meteorology,* Tokyo, 12(1):17–20, July **1956.** 3 figs., 10 eqs. In Japanese; English summary p. 20. **DWB**—Wind velocity nd temperature profiles and fluctuations in wind direction were observed over a rice field in Sept. 17–18, 1955. The mean wind velocity is measured with 10 small cup anemometers listributed logarithmically to a 6 m. height pole, and thermistor thermometers are used for he measurement of temperature distribution. Under the neutral thermal condition of the wind velocity of 1–5 m/sec at 2 m height, the zero-plane displacement d decreased and the roughness parameter z_0 increased respectively with the increase in wind velocity. These facts re contrary to results reported before (TANI, INOUE and IMAI, 1954); the cause of this dis- repancy seems to be due to the different conditions of rice stalks in growth stage, density, lexibility, etc. A wind direction-meter with 50 cm long arrow made with aluminum plate ends the signal of direction angle to the recording system by means of an A.C. selsyn-motor. The recording chart is of 12 cm. width which is corresponding to 130° direction angle, and the recording speed is regulated to be 2 mm/sec. Recorded charts are read at every 2.5 seconds nd these values are made use of in the following analyses. The histograms of wind direction how the normal distribution pattern with some exceptions. The range of fluctuation during 5 min. is about 30° under the condition of small turbulence and 60–70° under that of large urbulence. The lateral turbulent velocity $\langle v^2\rangle^{1/2}$ is in proportion to the mean wind velocity U, but under the unstable condition it becomes larger than under the neutral or stable con- lition. The lateral turbulent energy $\langle\varphi^2\rangle$ and the autocorrelation $R(t)$ with respect to the ngle fluctuation φ are calculated for some 3 cases, and the following results are obtained: (1) 1355–1400, 17th. The results indicate that the reading interval 2.5 sec of chart is too mall to obtain the characteristic nature of the wind turbulence concerned. (2) 1540–1545, 7th. The observation was carried out under the stable condition. The scale of the horizontal argest turbulon seems to be decreased so that the averaging time of 5 min seems almost omparable to the passage-time of that largest turbulon. (3) 1343–1348, 18th. In this run,

$1-R(t)$ shown to be in proportion to $t^{2/3}$ as expected theoretically, and the characteris time T_0 at which $R(t)$ becomes zero is shown to be about 60 sec. Considering that this ch acteristic time is much larger than the passage-time of the coupling turbulon directly influenc by the ground surface, which is estimated to be about 10 sec, the authors suppose that t turbulons observed here are not the coupling ones but the topographical ones of the mediu scale. (For Pt. 3, *see* 8.3–234, March 1957, *MAB.*) *Subject Headings:* **1. Vertical wi velocity distribution 2. Cup anemometers 3. Turbulence spectrum 4. Rice paddies.** *Authors' abstract.*

WIND EFFECTS

See also: **Shelter effects on microclimate** (Jensen), 9.10–279; **Windbreak effects on insolation** (Sato), 9.10–280; **Wind effects on point discharges** (Chalmers, Kirkman), 9.10–301.

9.10–214 551.556.1:551.515.2:551.577.61:633.

Nakagawa, Y. and Tsuboi, Y. (*both, Nat. Inst. of Agri. Sci.*), **The difference of inju between wind only treatment and wind-rain treatment (Experimental studies on the wi injury of the paddy rice, Pt. 2).** *Journal of Agricultural Meteorology*, Tokyo, 11(2):53–5 Oct. **1955.** 3 figs., 6 tables, 2 refs. In Japanese; English summary p. 56. **DWB**—It is common occurrence that typhoons strike frequently the southwest zone of Japan (Kyusy Shikoku) from Aug. to Sept. every year, since this period is the same as earing stage of t paddy rice in that zone, injuries to rice by typhoon are heavy. The wind injury of the padd rice is not only largely influenced by the wind velocity, its blowing duration, growing conditi of rice, but also influenced by the temperature and the humidity of the wind. In order determine the difference of injury between wind-only treatment (10 m/s, 3 hr) and wind and ra treatment (rain by shower in addition to wind), we carried out the experiment in the win tunnel at earing stage of the paddy rice. The results follow: 1) The injury of wind on treatment was heavier than that of wind and rain treatment, that is, the former showed larg increase in sterile spikelets, spikelets of fertility injuries than the latter. 2) The transpiratic rate of rice by wind treatment showed remarkable increase compared to that by nontreatmen but that by wind and rain treatment was lower. *Subject Headings:* **1. Typhoon damage to crop 2. Rainfall damage to crops 2. Rice crops 3. Japan.**—*Authors' abstract.*

9.10–215 551.556.4:551.311

Akai, S., **Meteorological study of the dunes of Tottori, Pt. 2.** *Japan. Meteorologic Agency, Tokyo, Memoirs of Industrial Meteorology*, 20(2):29–37, Jan. **1957.** 6 figs., 8 table 3 refs. In Japanese; English summary p. 37.—The present paper is the second report of t results of meteorological observations on the damage by sand-scattering and wind regardin the dunes of Tottori prefecture, which were carried out by the author and his collaborato The observations are made on the following points: 1) Present aspect of the protection again agricultural damage by sand-scattering; 2) Horizontal distribution of mean wind velocity b land and sea breezes; 3) Alternation of land and sea breezes; 4) Wind profile near the groun 5) Wind velocity on the slope of dune. (For Pt. 1, *see* 6.11–336, Nov. 1955, *MAB.*) *Subje Headings:* **1. Sand dune-wind relationships 2. Sand dune ecology 3. Wind erosion 4. To tori, Japan.**—*Author's abstract.*

9.10–216 551.556

Aleksandrova, G. G., **Chernaia buria zimoĭ.** [The black storm of winter.] *Prirod* Moscow, 45(5):110–111, May **1956.** 2 figs. **DLC**—Weather and temperatures at Kamennai Step' (eastern part of Voronezh Oblast) during Dec. and Jan. are described briefly and detailed account is given of a black storm which occurred during March 1954. A stron southeast wind arose on March 2nd with a velocity of 12–16 m/sec and intensified toward evening. All snow was blown off the fields on the first day and was carried off into the a together with upper soil layer. The wind continued for eight days blowing soil particles aft the snow disappeared. Illustrations showing the effects of the storm on the ground surface ar presented. *Subject Headings:* **1. Snow-dust storms 2. Wind erosion 3. Soil-snow transpo by wind 4. Kamennai Steppe, U.S.S.R.**—*I.L.D.*

9.10–217 551.556.4:551.510.42:551.21

Shrock, Robert R. (*Mass. Inst. of Tech.*), **Sedimentation and wind action around volcano Parícutin, Mexico.** *Indiana Academy of Science, Proceedings*, 55:117–120, **1945.** 4 figs. **DWB**—A brief discussion of the role the wind plays in redistribution of volcanic ash around an active volcano, based on observations at Parícutin on May 12, 1944. The ash-laden column extends thousands of feet above the top of the 1500 foot high cone, but upper winds blow across the column making a triangular cloud. Turbulence carries the ash in all directions and downward, to some degree, but not as far as it is carried downwind. At night when the temp. contrast is greatest, a violent in-blowing wind raises ashes and dust from the ground, reducing visibility. Ashes are thus blown off of exposed slopes and settle in low spots. Ripples and whirlwinds are other features mentioned. Water is not as effective, unless torrential rains occur, in the levelling process. A graphical model of winds, ash column, ashfall ,turbulence, etc. to 10,000 ft is presented. *Subject Headings:* **1. Volcano winds 2. Parícutin, Mexico.** —*M.R.*

UPPER AIR WINDS

See also: **Sporadic E movements** (Goodwin), 9.10–169.

9.10–218 551.557:551.542.1(213)

Fortak, H., **Über beschleunigungsfreie Luftbewegungen in äquatorialen Breiten.** [Nonaccelerated air movements in equatorial latitudes.] *Geofisica Pura e Applicata*, Rome, 18:141–146, **1957.** ref., 24 eqs. German and English summaries, p. 141. **DLC**—Considering all Coriolis-terms and the adiabatic condition, there follows a representation of the geostrophic wind, which is applicable to equatorial latitudes. *Subject Headings:* **1. Equatorial circulation 2. Geostrophic winds.**—*Author's abstract.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

HUMIDITY

See also: **Cloudiness effects on humidity** (Kozakov), 9.10–239.

9.10–219 551.57:631.67

†Tison, L. J. (*Secretary-Gen. Int. Assoc. of Hydrology*), **Hydrology (including irrigation).** *UNESCO, Arid Zone Research*, 9:66–106, **1957.** 53 figs., 6 tables, 33 refs. **DWB, DLC**—Deals with precipitation including rain gage network, mean height of rainfall in a given region, etc.; evaporation and its measurement by formula or directly; measurement of transpiration; consumptive use of water of bare soil or soil with a grass cover; infiltration; subterranean water; zone of aeration; zone of saturation; ground water hydrology of calcareous formations; surface water including stream discharge; floods; measurement of river stages; transport of solids by streams, etc., and techniques and problems of irrigation. The discussion is quantitative and includes numerical data. *Subject Headings:* **1. Hydrometeorological studies 2. Irrigation 3. Hydrologic cycle.**—*I.L.D.*

9.10–220 551.571:551.577.2

Kallós, Mrs. Imre, **A csapadékmennyiség és a nedvességtartalom kapcsolata.** [Relation between precipitation amount and humidity.] *Időjárás*, Budapest, 61(3):191–199, May/June **1957.** 8 figs., table, 4 refs. English summary p. 191. **DLC**—Weather during the first half of July 1955 is analyzed from the point of view of water-vapor content of the air. Precipitation of larger amount has been recorded during the observational period only when the numerical value of the water vapor content considerably surpassed the average value of July. In analyzing specific moisture it turned out that the largest advection of moisture took place on 850 and 700 mb levels. In connection with the large amount of precipitation of July 9, the author points out that in Transdanubia large amounts of precipitation are to be expected in case of a cyclone coming from the south and passing over the Carpathian basin with its

warm sector in northern direction. After that, rainy weather is to be expected if an anticycl is forming north and north-east, respectively, from the Carpathians and this hinders cyclone in moving out of the Hungarian basin. *Subject Headings:* **1. Humidity-precipita amount relationships 2. Cyclonic precipitation 3. Transdanubia, Hungary.**—*Auth abstract.*

9.10–221 551.571:62:620.

Kohloss, Frederick H. (*Consulting Engineer, Honolulu*), **Why and when we use air-coo condensers in Hawaii.** *Air Conditioning, Heating and Ventilating*, N. Y., 55(2):89–90, F **1958. DWB, DLC**—Air-cooled condensers vs. evaporative condensers or cooling towers discussed. The advantages of the former are due to the tropical ocean climate and expos to the meteorological elements rather than constructional features. Excessive corrosion of aluminum fins on the copper coils is caused by the salt content of the air. *Subject Headin* **1. Air-cooled condensers 2. Corrosion of metals 3. Salt air corrosion.**—*W.N.*

EVAPORATION AND EVAPOTRANSPIRATION

See also: **Agromet. services, West Germany** (Uhlig), 9.10–68; **Evaporation research, Netherlands,** 9.10–76; **Evaporation data comparisons** (Kaulina), 9.10–129.

9.10–222 551.573:551.57

Milburn, Richard (*Fort Detrick, Frederick, Md.*), **Theory of evaporating water clou** *Journal of Colloid Science*, N. Y., 12(4):378–388, April **1957.** 2 figs., 10 refs., 32 eqs. **DLC** The mass and heat transfer processes within clouds of water droplets are studied. Vap concentration, temperature, and droplet size are described by continuous field functions. simple nonlinear differential equation is developed to govern the propagation of these fiel in space and time. Solutions of an approximate linear equation are found in order to descri the initial stages of cloud evaporation and to illustrate two different types of boundary co dition. *Subject Headings:* **1. Evaporation from clouds 2. Evaporation theories.**—*Autho abstract.*

9.10–223 551.5

Szesztay, Károly, **Tapasztalati eljárás a területi párolgás meghatározására.** [Empiric method of determining regional evaporation.] *Hungary. Vizgazdálkodási Tudomany Kutató Intézet, Beszámoló . . . évi Munkásságárol*, 1954: issued **1955.** p. 72–80. 4 fig table, 7 refs., 3 eqs. Russian and English summaries p. 203. **DWB**—By using a graph f the evaluation of monthly evapotranspiration, developed originally by the Russian Kuzn the hydrologic balance for the Zagyva River is computed. A method is suggested to determi the free porosity of water bearing layers and, finally, the daily water balance is computed a compared with precipitation, snow curves, temperature, relative humidity and duration sunshine. *Subject Headings:* **1. Evapotranspiration 2. Hydrologic cycle 3. Zagyva Rive Hungary.**—*A.A.*

9.10–224 551.573:551.508.

Vinck, Friedrich, **Die Verwertbarkeit von Piche-Evaporimetern für die Bestimmung d Gebietsverdunstung.** [Use of Piche evaporimeters in areal evaporation determinatio *Deutsche Gewässerkundliche Mitteilungen*, Coblenz, 1(4/5):73–76, Oct. **1957.** 2 figs., table **DWB**—In Schleswig-Holstein, evaporation measurements have been in practice since No 1953. It is shown that the data obtained by the five lysimeters depend too much on loc conditions to be useful for areal evaporation determination. It was suggested that the r quired network density could be achieved by the use of Piche evaporimeters which are f simpler and less expensive than lysimeters. In order to test the performance of Piche eva orimeters their results were compared with lysimeter data during 1955 and 1956. Prelimina findings of the comparison are reported in this paper. They are termed promising as t ratio lysimeter/evaporimeter reading appears to be directly related to rainfall amount. *Subj Headings:* **1. Areal evaporation measurements 2. Piche evaporimeter 3. Lysimeter-eva orimeter data comparisons 4. Schleswig-Holstein, Germany.**—*G.T.*

CONDENSATION

See also: **Icing of aircraft** (Brun), 9.10–92; **Freezing of supercooled water** (Itoo, Hama), 9.10–150.

9.10–225 551.574.1

Kachurin, L. G.; Zaĭtseva, N. A., and Lomanova, S. I. (*Leningrad Hydromet. Inst.*), **O peraturnykh granitsakh obrazovaniia ledianykh chastits v peresyshchennom vodianom e.** [Temperature limits for the formation of ice particles in saturated water vapor.] *ademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 7:857–861, July **1956.** 2 figs., table, 3 refs. C. English trans. by E. R. Hope. Issued by Canada. Defence Research Board, T 237 R, . **1957.** 4 p. 2 figs., etc. **DWB**—The author presents experimental evidence showing t the lower limit of −31°C separating the region of stability of water and ice particles in ersaturation water vapor can be shifted by altering the thermodynamic processes. The erimental apparatus which is a variant of that employed by Fournier d'Albe was used bserve the formation of condensation particles during rapid rarefaction of moist air (close he adiabatic) and the temperature limits of the sudden change of the formation of liquid and condensations were found to be −32°C and −41°C. Experimental data on the variations he temperature limits separating the liquid and ice phases under differing thermodynamic ditions are presented in a table. *Subject Headings:* **1. Ice crystal formation 2. Nuclei and perature 3. Ice nuclei.**—*I.L.D.*

9.10–226 551.574.1

Khrgian, A. Kh. and Mazin, I. P., **Analiz sposobov kharakteristiki spektrov raspredeleniia achnykh kapel'.** [Analysis of methods of the characteristic spectra of distribution of ud drops.] *Moscow. Tsentral'naia Aerologicheskaia Observatoriia, Trudy*, No. 17:36–46, 56. 20 refs., 3 tables, 6 figs. **DLC**—Various theoretical and empirical formulas developed determining the distribution of the sizes of cloud drops are presented and tested for their idity by comparing results obtained with them to experimental data. The formulas of ST, KHRGIAN and MAZIN and of LEVIN are analyzed. None of the characteristics such as an median or modal drop radius or the radius having the maximum effect upon water ntent provides a complete concept of the spectral distribution of cloud drops. A fuller scription is obtained by adding the law of dispersion of drop sizes. *Subject Heading:* **1. Cloud plet size distribution.**—*I.L.D.*

9.10–227 551.574.1:551.578.41

Klinov, F. Ia., **Sviazannaia kristallizatsiia vodianykh parov atmosfery.** [Crystallization atmospheric water vapor on objects.] *Meteorologiia i Gidrologiia*, Leningrad, 7:22–25, ly **1957.** 2 figs., 3 tables. **DWB, DLC**—An analysis of observations on the crystallization atmospheric vapor on objects at temperatures below −40°C carried out in connection with udies on the conditions, formation and growth of the structural properties of crystals in the mosphere. The crystallization was observed on wires, thread (glaze), piles, glass objects, c. It was found that in the layer of the atmosphere near the ground the crystallization of ter vapor is not uniform. Marked intensity of crystallization occurs at 200–300 m above e earth's surface and almost none is observed below this layer in the case of temperatures low −40°C. Different types of crystals arise at the same time at different levels. In the yer of the atmosphere near the ground the intensity of crystallization on objects increases th altitude; the granules of hoar frost increase in size with elevation, and crystal forms edominate over granular. Granular hoar frost is physically not produced by the crystallization of water vapor on objects but is attributed to this phenomenon in view of its relationship crystalline hoar frost growing on nuclei on objects as a result of the repeated condensation water vapor from supercooled droplets on the object. Data on the types of crystalline ar frost observed, the pressure, water vapor, tension, relative humidity, etc. associated with e formation of hoar frost and on the most characteristic types of crystallization on glass jects and crystal types are shown diagrammatically. *Subject Headings:* **1. Ice crystal formation on various surfaces 2. Hoar frost.**—*I.L.D.*

9.10–228 551.574.1:551.5

Sano, I.; Fujitani, Y. and Maena, Y. (*all, Chemical Inst., Nagoya Univ.*), **An experim investigation on ice-nucleating properties of some chemical substances.** *Meteorol Society of Japan, Tokyo, Journal*, Ser. 2, 34(2):104–110, May **1956.** 5 figs., 4 tables, 11 2 eqs. **DWB, DLC**—A cold-box of the diffusion cloud chamber type was constructed, about 115 substances, inorganic as well as organic, after being dispersed either by condens method to smoke particles ranging from 0.1μ to 0.8μ in diameter or by dispersion meth those of 0.5μ to 2.0μ diameter, were tested as to nucleating ability; the temperature of nu tion at which ice crystals make their hasty appearance, and the vividness of the phenom was observed by the naked eye. The results show that, among others tested, NiO, C BiI_3, MgO, HgI_2, etc. (all of which are not of hexagonal type of crystal systems) beha active ice nuclei, though silver iodide is found, in fact, to be most effective. The ru experiment on the particle size dependence of the ice-nucleating activity were carried out using iodides of silver, mercury and lead, oxides of nickel, magnesium, aluminum and and, in addition, urea, each of them being of the particle size smaller than several micro diameter. It was found in all these cases that the temperature of nucleation lowers ra as the particle size becomes finer over 0.2μ, or thereabouts, in diameter. A thermodynar consideration on the relation between the nucleation temperature T_c (°K) and the pa radius r (μ) leads to the following equation

$$1/(r+\Delta)=a-bT_c, \qquad a=b(T_0-x)$$

wherein Δ, b, x are empirical constants and $T_0=273$; Δ denotes the thickness of a qua structure formed by water molecules absorbed from the vapor onto the nucleating par b is comprehensive of the surface tension of the outermost layer of the structure and x r to a measure of the magnitude depending upon the accuracy of the determination o The equation has proved to agree with the experimental results. *Subject Headings:* **1. N effectiveness 2. Cloud chamber studies of nuclei.**—*Authors' abstract.*

9.10–229 551.574.1:551.5

Shimada, T.; Sekihara, K. and Kawamura, K. (*Met. Research Inst.*), **An effect of u violet radiation on the action of silver iodide particles as sublimation nuclei.** *Meteorol Society of Japan, Tokyo, Journal*, Ser. 2, 33(6):276–279, Dec. **1955.** 6 figs., 3 tables, 5 2 eqs. In Japanese; English summary p. 276. **DWB, DLC**—The inactivation of ultrav ray on silver iodide as a sublimation nuclei was examined experimentally, using natural (s and artificial (mercury arc) light sources. The silver iodide particles produced at the perature of 600–700°C were introduced into the diffusing boxes which were equipped with t different kinds of filter, i.e., cutting off the light of wavelength shorter than about $\lambda-240$ $\lambda-345$ mμ and $\lambda-415$ mμ, respectively. Then they were irradiated by ultraviolet ra natural or artificial source. In order to examine the nucleating properties of silver io particles, a small part of them was sampled by a syringe at proper time intervals and injected into the cold box at the temperature of $-14\sim-16$°C. Then the number o crystals formed in the cold box was counted by visual observation. The logarithm of cou number was plotted against time (minutes) and the decay constant was determined graphic from the slope. On the other hand, the effective energy distribution of ultraviolet radia which actually exerted on the silver iodide particles in each diffusing boxes was compu using the properties of filter transmissions and the light source. Thus the decay constan the light of unit energy in different ranges of wavelength was finally determined. Accor to these results, the efficiency of inactivation became better, as the wavelength of ultra v ray irradiated became shorter. But in the case of solar radiation the intensity of radia shorter than $\lambda-350$ mμ was so weak that the actual effect was almost due to the longer of the radiation. The rate of decay was about 1/500 per hour when irradiated through cellophane-filter by natural light on a clear day. *Subject Headings:* **1. Nuclei effective 2. Cloud chamber studies of nuclei 3. Ultraviolet light effects on nuclei.**—*Authors' abstr*

9.10–230 551.574.1:551.52

Verzár, F. and Kunz, Yvette, **Production of atmospheric condensation nuclei by s radiation.** *Geofisica Pura e Applicata*, Rome, 38:215–221, **1957.** 7 figs., 7 refs. En

d German summaries p. 215. **DLC**—Air with a very low count of atmospheric condensation clei was irradiated by direct sunlight through an uviol glass window, or through ordinary ss or in a polyethylene balloon. The nucleus count rises immediately and reaches very high lues. *Subject Headings:* **1. Artificial nuclei production 2. Nuclei and ultraviolet radiation Nuclei formation.**—*Authors' abstract.*

9.10–231 536.421:546.212:551.574.12

Kiriukhin, B. V. and Pevzner, S. I., **Temperatura zamerzaniia vzveshennykh v masle pel' vody i rastvorov soleĭ.** [Freezing temperature of water drops in salt solutions suspended in oil.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy,* 57(119):101–107, 56. 3 figs., 10 refs. **DLC**—The freezing temperature of drops was determined by the ethod of balanced drops which involves the suspension of water drops in oil mixtures and ich was developed by L. DUFOUR (1861). The procedure is described with the aid of a agram of the apparatus. The results are as follows: the freezing of droplets (suspended in l) depends upon their sizes with the smaller ones freezing at lower temperatures; the lowering freezing temperatures is directly proportional to rate of cooling; the freezing temperatures termined by the method of balanced drops is considerably lower than that determined by e method of heat vaporization; the presence of oil mixtures raises the freezing temperature d freshly produced AgI crystals raise considerably the freezing temperature. *Subject eadings:* **1. Freezing of water drops 2. Freezing temperature of drops 3. Freezing processes aqueous solutions.**—*I.L.D.*

9.10–232 551.574.2:551.509.67

Soulage, Guy, **Nuages équatoriaux naturels et essais de formation artificielle de cumulus icécipitants.** [Natural equatorial clouds and attempts at artificial formation of precipitating umulus.] *Puy-de-Dôme. Observatoire, Bulletin,* Ser. 2, No. 1:9–24, Jan./March **1957.** 4 gs., 3 refs. **DWB**—A report on the experiments begun by H. and J. DESSENS in 1955 (*see lso* 9.8–144, Aug. 1958, *MAB*) at Lukolela in the Belgian Congo (1°S, 17°E) and continued 1956 by the author, using brush fires to produce artificial cumulus clouds and precipitation. study of the conditions under which natural clouds form in this area is first reported. Specific stances with photographs showing clouds, formed naturally and artificially, are cited in tail for various weather types. The season of 1956 was unusually poor for such experiments. arge cumulus were induced by the brush fires, but none gave any added precipitation. *Subct Headings:* **1. Artificial cumulus formation 2. Brush fire cloud formation 3. Lukolela, elgian Congo. I. Dessens, H. II. Dessens, J.**—*M.R.*

9.10–233 551.574.42

Kanter, TS. A., **Gololed v Saratovskoĭ oblasti.** [Glaze in Saratov Province.] *Meorologiia i Gidrologiia,* No. 2:29, Feb. **1957. DWB, DLC**—Heavy deposition of glaze occurred in Saratov Province during Dec. 20–29, 1954. It was associated with a southern cle so that the area was before a warm front. An inversion was present. Hence warm infall falling through cold air near the surface was cooled and in the presence of strong outherly wind dense transparent ellipsoidal ice deposits were produced; with most of the eposition being on the windward side. The effect of local conditions upon intensity of eposition, namely relief, exposure, etc. is discussed. *Subject Headings:* **1. Glaze intensities . Saratov Province, U.S.S.R.**—*I.L.D.*

9.10–234 551.574.7:629.13

Khimach, M. A., **Otlozhenie l'da iz pereokhlazhdennykh oblakov i tumanov.** [Deposition ice from supercooled clouds and fogs.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, rudy,* 57(119):44–49, **1956.** 15 refs., 2 tables, 6 figs. **DLC**—On the assumption that the ing of airplanes is analogous to the formation, glaze investigations were carried out to deterine the dependence of the amount of ice deposition upon the water content and microstructure clouds. During airplane flights through supercooled clouds ice was collected upon metallic ds and cloud drops, water content of clouds and temperature were measured. The results various flights are presented in tables and graphs. It is shown that ice deposition increases

with increase in drop size and water content of supercooled clouds and fogs. *Subject Headin* **1. Icing of aircraft 2. Water content of clouds 3. Supercooled clouds.**—*I.L.D.*

FOG

See also: **Ice fog, Alaskan area** (Hutchison), **9.10–53.**

9.10–235 551.575.1:551.57

Alkind, Charles (*Stanford Res. Inst.*), **We freeze fog.** *Instrumentation*, N. Y., 10(4):8 July/Aug. **1957.** photos. **DWB**—The cold chamber installed at Stanford Research Institu Menlo Park, Calif., is described and illustrated. The chamber has a working space 8 ft l 6 ft wide and 6 ft high. Temperatures as low as −80°F can be produced with a choice humidity and wind conditions. Researchers work inside the chamber. Auxiliary equipm used includes an aerosol camera (primarily for studying ice fog) and a small wind tunnel precipitation static and other studies). *Subject Headings:* **1. Ice fog 2. Cold chambe** —*G.T.*

CLOUDS

See also: **Cirrus height estimation** (U. S. AWS), **9.10–28**; **Cloud atlas, U.S.S.R., 9.10–33**; **Cloud atlases, Afrikaans language, 9.10–34**; **Cloud atlases, Slovenian language, 9.10–36**; **Evaporation from clouds** (Milburn), **9.10–222**; **Elec. charge separation in cumuli** (Twomey), **9.10–298.**

9.10–236 551.576.1:551.515.8 551.509.

Dzhuraev, A. D., **Aerosinopticheskie issledovaniia vysokokuchevykh oblakov s polosa padeniia (Ac-virga).** [Synoptic aerological investigations of altocumulus clouds with scending streaks (Ac-virga).] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matemati Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 203–206. tables, 5 refs.) **DLC**—In order to determine whether the occurrence of the unstable clo form Ac is associated with the passage of fronts, the author examined all cases of Ac-vi observed at Tashkent over the period 1940–1950. Ac-virga is observed during the en year. The greatest number of days with Ac-virga (about 86%) occur during cold incursio The number of days with Ac-virga associated with cold air incursions increases from the c to the warm season, since the distribution of days with Ac-virga not associated with cold incursions is less in the warm than in the cold season. A comparison of the temperat of the day with Ac-virga with the temperature of the preceding and succeeding day and c sidering only whether the temperatures rise or fall, indicates that in 77% of the cases there v a cooling relative to the preceding day and in 23% a warming. The extent of rise or fall temperature are as follows: cooling by 4°C or more; cooling from 0.1° to 4°C; warming by 9 and warming from 0.1° to 4°C. From a further examination of the vertical thickness of cool it is evident that Ac-virga is observed generally during the deep vertical incursions of cold a *Subject Headings:* **1. Altocumulus-virga 2. Synoptic aerological studies 3. Frontal passa** —*I.L.D.*

9.10–237 551.576.1:551.51

Maenhout, A., **Une tuba au-dessus de Gand.** [A funnel-cloud over Gand.] *Ciel Terre*, Brussels, 72 (11/12):632–634, Nov./Dec. **1956.** 3 figs. **DWB**—A case history stu of a funnel cloud which appeared at 6:30 p.m. on July 20, 1956 as a "tuba" (or a funnel reaching the ground) over Gand. The rotary motion of the funnel was anticyclonic. Abo 30% of all funnels observed are anticyclonic, and these are the least developed and shorte lived group, on the whole. The physical explanation of such anticyclonic motion is given a illustrated. *Subject Headings:* **1. Funnel clouds 2. Anticyclonic motion of tornadoes 3. Ga Belgium.**—*M.R.*

9.10–238 551.576.2:551.57

Berkes, Zoltán, **A csapadék és a felhőzet átlagos mennyiségének kapcsolata.** [Relati between the average amounts of precipitation and cloudiness.] *Időjárás*, Budapest, 61(178–184, May/June **1957.** 8 figs., table, 9 refs. English summary p. 178. **DLC**—By co

paring monthly normal values of precipitation and cloud-amount in the Carpathian basin, the author finds that the yearly march of these two elements is roughly inverse. The ratio of precipitation/clouds—as a numerical value, characteristic of precipitation-effectiveness of the clouds—shows in its large features a parallelism with the yearly march of temperature and water-vapor content respectively. The ratio P/Cl is generally larger in the basin than in mountain regions. *Subject Headings:* **1. Cloudiness-precipitation relationships 2. Carpathian basin.**—*Author's abstract.*

9.10–239 551.576.2:551.524:551.571

Kozakov, L. A., **Vertikal'noe raspredelenie meteorologicheskikh elementov v atmosfere zimoĭ v zavisimosti ot usloviĭ oblachnosti.** [Vertical distribution of meteorological elements in the atmosphere in winter as dependent on cloudiness.] (In: Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, **Meteorologiia i gidrologiia v Uzbekistane.** Tashkent, **1955.** p. 207–210. fig., table, ref.) **DLC**—The characteristics of the vertical distribution of temperature and relative humidity as a function of cloudiness were studied by means of pilot balloons with sensitive meteorographs. The effect of cloudiness upon radiation and consequently upon the daily variation of temperature and its vertical distribution are discussed and data are presented on the mean values of temperature, relative humidity and specific humidity and gradients of these values at elevations from 0.0 to 0.5 km for three degrees of cloudiness. The variation of temperature with height during morning hours in winter depends upon particular degrees of cloudiness since it is closely associated with the effective nocturnal radiation. During the day the influence of insolation and other factors renders impossible the examination of the variation of temperature with height only as a function of given degrees of cloudiness. In Tashkent there is an inversion of 11.2°±2°C in the lower 0.5 km during winter mornings when the weather is clear or when either cirrus clouds or medium level clouds of less than 5 points are present. In the case of medium level clouds exceeding five points the inversion amounts to 6°±2°C. If the cloudiness of the lower level exceeds 8 points the lower 0.5 km is characterized either by isothermy or by gradients not exceeding ±0.40°C/100 m. *Subject Headings:* **1. Cloudiness effects 2. Vertical temperature distribution 3. Vertical humidity distribution 4. Tashkent, U.S.S.R.**—*I.L.D.*

PRECIPITATION

See also: **Droughts, Australia** (Foley), 9.10–23; **Record rainfall and flash floods, Mobile, Ala.** (Pierce, Tate), 9.10–27; **Representativeness of average rainfall** (Majumdar, Gangopadhyaya), 9.10–105; **Drought, Western Kansas** (Palmer), 9.10–139; **Salt content of precip.** (Durov, Fedorova), 9.10–153; **Rainfall damage to rice crops** (Nakagawa, Tsuboi), 9.10–214; **Humidity-precip. amount relationships** (Kallós), 9.10–220; **Cloudiness-precip. relationships** (Berkes), 9.10–238; **Precip. distribution, Low-Cévennes** (Rebotier), 9.10–264; **Drought resistance** (Shantz), 9.10–285.

9.10–240 551.577(26)

Wyrtki, Klaus, **Rainfall over the Indonesian waters.** *Indonesia. Lembaga Meteorologi en Geofisik, Djakarta, Verhandelingen,* No. 49, **1956.** 24 p. 11 figs., map (fold.), 13 refs. **DWB**—A chart of the average annual rainfall over the Indonesian waters between 6°N and 11°S and between 95° and 141°E is drawn under consideration of the decrease of rainfall from land to sea. The area is divided into 12 regions, for which the average annual variation of rainfall is given graphically and numerically. A comparison with the frequency of rainfall in these regions shows a good agreement of the annual means. Comparisons with other rainfall charts demonstrate that the evaluation of the rainfall in this area has been too high in the past, while the newest charts of MÖLLER give values a little too low. The average rainfall over the seas amounts to 1875 mm/yr, over land and sea 2170/yr in this area. *Subject Headings:* **1. Rainfall at sea 2. Rainfall frequencies 3. Indonesian waters.**—*Author's abstract.*

9.10–241 551.577.11:551.578.4

Kharlamov, Ia. I., **Neobychnye osadki.** [Unusual precipitation.] *Meteorologiia i Gidrologiia,* Leningrad, No. 8:47, **1957.** fig. **DLC, DWB**—The unusual form of precipitation illustrated by means of a photograph) which fell on May 7, 1957 at Irkutsk consisted of pieces

of dense snow, pear shaped, with a length of 15–20 mm. The fall occurred from Cb clo over a period of 4–5 min. *Subject Headings:* **1. Unusual precipitation formation 2. Sn formations 3. Irkutsk, U.S.S.R.**—*I.L.D.*

9.10–242 551.577.2:551.482:551

*Cappus, P., **Répartition des précipitations de faible superficie sur un bassin versa** [Distribution of small area rainfall in a watershed.] *Société Hydrotechnique de Fran Mémoires et Travaux*, No. 1:86–96, **1957.** 4 figs., 8 tables, 15 refs. English summary p. **DLC, DWB.** Reprinted in *La Houille Blanche*, Grenoble, 12(Sp. No. A):332–342, May/Ju **1957.** 4 figs., etc. **DLC**—An extensive and intensive study of the problems connected w rainfall sampling in a small basin was undertaken in the 3.1 km² Alrance experimental ba (770–960 m) of France during 1951–6. The network relief, measured and actual precipitati influence of wind and altitude on the mean rainfall, tracing the isohyets, amount of precipitat which fell as rain, monthly and daily variability of rain, effect of wind at summits, sn precipitation and total annual precipitation, accuracy of means on opposing slopes, chc of and number of gage sites are discussed quantitatively from an engineer's point of vi *Subject Headings:* **1. Precipitation studies 2. Rainfall distribution in small watersh 3. Alrance Basin, France.**—*M.R.*

9.10–243 551.577.3(7

*Kendall, G. R. and Thomas, M. K. (*both, Met. Service of Canada*). **Some characterist of precipitation in the Canadian Prairies.** (In: Angola. Serviço Meteorológico; **Miscelan geofísica.** Luanda, **1956.** p. 312–323. 7 figs., table, 5 refs.) **DWB** (M77 K33s)—P cipitation in the agricultural portion of the Canadian Prairies ranges from 12 to 22 in. on average, and has a well-marked maximum in the summer season. The range of the coefficie of variability of annual precipitation is from 20 to 28%, the higher values occurring in the d sections of the area. Using data for the period 1891 to 1955, it is shown that heavy precipi tion during the first decade of this century was followed by a long period of generally subnorm precipitation. During the early 1950's, however, precipitation has again increased to a re tively high level. *Subject Headings:* **1. Precipitation trends 2. Long period records 3. P cipitation regime 4. Prairie Province, Canada.**—*Authors' abstract.*

9.10–244 551.577.2:551.577.36(5

Imayama, M., **Relationship between the hourly rainfall and the total rainfall in Chikugo River drainage.** *Journal of Meteorological Research*, Tokyo, 8(9):581–584. O **1956.** 9 figs., 3 tables, ref., 10 eqs. In Japanese; English summary p. 581. **DWB, DLC** The results of investigation on the general pattern of rainfall in a mountainous area (Kitaogu and a plain (Hita) are presented in this paper. Total rainfall in the mountainous area is m than that in the plain. But in the mountainous area, rain begins earlier and ends later th in the plain; namely the rain duration in the mountainous area is longer. For two pluv metric stations (Kitaoguni and Hita), the rainfall amount per hour is examined. It w found that a statistical relationship exists between R mm (the totals of monthly, seasonal annual rainfall), r mm/hr (hourly rainfall intensity) and N (total number of hours with r more milimeters of rain) as follows:

$$\log R/N = a\sqrt{r} + b, \qquad \text{or} \qquad R/N = c \times 10^{a\sqrt{r}},$$

where a, b and c are constants. Moreover, these constants for the Kitaoguni and Hita statio have nearly the same values; this shows that the mean rainfall intensities at the two statio are nearly equal, and each hourly rainfall intensity is proportional to the number of ho with rain. *Subject Headings:* **1. Hourly precipitation data 2. Rainfall amount 3. Rainf intensities 4. Kitaoguni, Japan 5. Hita, Japan.**—*Author's abstract.*

9.10–245 551.577.37(

Aki, Koichi and Miura, Takao, **The regional distribution of heavy rainfall in Jap** *Pacific Science Congress, 8th, Quezon City, Philippines, Nov. 1953, Proceedings*, Vol. IIA, pu **1956.** p. 1145–1154. 4 figs., table. **DWB**—The regional distribution and frequency rainfall in Japan is examined in relation to climatology and topography and the rainfall broug on by typhoons is discussed. A table giving percentage of annual precipitation by cau

949) and maps with frequency of rain of typhoon origin exceeding 100 mm, accumulated epth of typhoon rain over 100 mm and a graph showing total rain volume of major typhoons e presented. *Subject Headings:* **1. Rainfall frequencies 2. Rainfall distribution 3. Heavy infall distribution 4. Typhoon rainfall 5. Japan.**—*I.L.D.*

9.10–246 551.577.37:551.579.4(447)

§*Fontaine, P., **Les crues dans le bassin de la Garonne.** [Floods in the basin of the Garonne.] *France. Météorologie Nationale, Notice d'Instructions Techniques*, Section 15, No. 1, 1955? 11 p. 5+7 figs., table. **DWB** (M79.4 F815cr)—Meteorological causes of the winter and spring floods in the Pyrenees and a detailed synoptic, aerological and hydrological study of the catastrophic floods of Feb. 1952 in the Garonne Basin are treated in this report, accompanied by schematic actual synoptic and aerological charts, hydrographs and precipitation-runoff data. Risks of heavy floods in this basin are analyzed according to the several prevailing conditions necessary for floods. *Subject Headings:* **1. Floods, Pyrenees 2. Floods, Garonne Basin (Feb. 1952) 3. Flood studies 4. Garonne Basin, France.**—*M.R.*

9.10–247 551.577.38(52)

§*Kakehashi, I. and Nakanishi, K. (*Tsu Weather Station*), **About the summer drought and the climatic variation in Mie Prefecture.** *Japan. Meteorological Agency, Tokyo, Memoirs of Industrial Meteorology*, 19(2):81–89, March **1956.** 5+figs. In Japanese; English summary p. 89. **DWB, DLC**—Droughts in the past are examined by means of the data of 66 yrs (1890–1955) of various meteorological elements, such as temperature, amount of precipitation, duration of sunshine, and number of days with no rain. As the data of the Tsu Weather Station only are used, it is doubtful whether the obtained results are applicable to other districts. In this paper the authors define the drought year in the past with some conditions, and the climatic variation is investigated for the periodicity of temperature and amount of precipitation. Results are as follows: (1) Years of drought are apt to occur two years in succession and a drought periodicity of ten years predominates; (2) As for the amount of precipitation, a periodicity of 12 years is predominant; (3) A periodicity in air temperature of 22 years predominates; (4) Relations between sunspots and the amount of precipitation: (a) a year of sunspot maximum has in its vicinity years of drought and heavy rain alternately occurring with large amplitudes; (b) in years around a year of sunspot minimum, the amplitude is small and is apt to be normal; (c) the amount of precipitation is maximum in the year of maximum of sunspots, and minimum in the year of minimum number of sunspots. *Subject Headings:* **1. Droughts, Mie Prefecture, Japan 2. Drought periodicities 3. Precipitation amount 4. Sunspot-precipitation relationships 5. Mie Prefecture, Japan.**—*Authors' abstract.*

9.10–248 551.577.38(74)

*McGuire, James K., (*U. S. W. B., N. Y.*) and Palmer, Wayne C., (*U. S. W. B., Wash., D. C.*), **The 1957 drought in the eastern United States.** *Monthly Weather Review*, Wash., D. C., 85(9):305–314, Sept. **1957.** 3 figs., 6 tables, 5 refs. **DWB**—Various aspects of the Eastern United States drought of 1957 are discussed and some of the pertinent data are tabulated and summarized. These include amount of the summer rainfall, a derived and experimental measure of "moisture adequacy," and the 5-month percentage of long-term mean precipitation—by climatological divisions insofar as possible. Some of the unusual and record-breaking aspects of the weather during the spring and summer are listed and monthly precipitation reports from 113 selected points from Virginia to Maine are tabulated. In addition, actual measurements of soil moisture are tabulated for a number of locations. The worst of the moisture deficiency occurred in the coastal strip from inner Cape Cod to the Virginia Capes, a conclusion borne out by summaries of the streamflow and groundwater measurements of the Geological Survey as well as by the crop condition reports of the Agricultural Marketing Service. *Subject Headings:* **1. Drought, Eastern U. S. (1957) 2. Rainfall amounts 3. Eastern United States.**—*Authors' abstract.*

9.10–249 551.577.51(521.7)

Kodama, R., **On the orographic rain on the slope of Mt. Ibuki, Pt. 2.** *Journal of Meteorological Research*, Tokyo, 8(10):642–648, Nov. **1956.** 10 figs., 3 tables, 4 refs., 3 eqs. In

Japanese; English summary, p. 642. **DWB, DLC**—In this paper the author has analyzed t distribution of the orographic rain observed on the southern and western slopes of Mt. Ibu Shiga Prefecture. And the following results are obtained: 1) The maximum of the rainfl amount is mostly found in the middle parts of both the southern and western slopes, and t amount on the lee side is rather larger than that of the windward side; 2) Based on an assum tion that the orographic rainfall is caused by the process that the raindrops grow by collisi with each other while falling in clouds, the author has computed the distribution of the rainfl by using the theories of BAUNON and LANGMUIR and obtained a satisfactory result. (F Pt. 1, *see* 7.3–236, March 1957, *MAB*.) *Subject Headings:* **1. Orographic rainfall 2. Rainf distribution 3. Mt. Ibuki, Shiga Prefecture, Japan.**—*Author's abstract.*

RAIN, SNOW AND HAIL

See also: **Hail statistics, U. S.** (Hull), 9.10–19; **Snow and ice constructions (buildings), U.S.S.R.** (Voitkovskiĭ), 9.10–21; **Avalanche velocity** (Kozik), 9.10–110; **Hoar frost formation** (Klinov), 9.10–227; **Ice fog** (Alkind), 9.10–235; **Snow formation** (Kharlamov), 9.10–241; **Elec. charges on blowing snow** (Norinder, Siksna), 9.10–302.

9.10–250 551.578.

Kobayashi, T. (*Inst. of Low Temp. Science, Hokkaido Univ.*), **Measurement of raindr size by means of photographic paper treated with $CoCl_2$.** *Meteorological Society of Japa Tokyo, Journal*, Ser. 2, 33(5):217–219, Nov. **1955.** 6 photos, fig., 4 refs. In Japane **DWB, DLC**—Illustrations show records of raindrops of 3.1 mm diameter on photograph paper by MAGONO's and by SAKAGISHI's method. In the latter the pulverized developer w scattered on the photographic paper as soon as the drops made contact, thus preventing t formation of an enlarged imprint and a larger "penumora." Other exposures were made scattering the developer before the drops impacted, on a paper covered with developer, a using the cobalt chloride photographic paper method. Size distribution curves are shown fl various rainfall rates. *Subject Headings:* **1. Raindrop size distribution measurements 2. C balt chloride method of raindrop size measurement.**—*M.R.*

9.10–251 551.578.42:551.578.

Shiotani, Masao and Arai, Hideo, **Short note on the snowstorm.** *Japan National Congre for Applied Mechanics, 2d*, 1952, *Proceedings*, pub. May **1953.** p. 217–218. 2 figs., 9 eq **DWB** (620.1 J35p), **DLC** (TA350.J35)—A concise summary of extensive work on the vertic distribution of snow during "blowing snow," and other factors in its movement above a sno cover. Whereas sand (25 mm) settles at a velocity of 500 cm/sec, snow settles at 20–50 cm/se The equation for turbulent diffusion of snow powder is given, and applied to several cas Most of the snow caught by a special apparatus was in the 1 m layer of air just above t surface. Vertical distribution is shown in curves for 5 series of measurements. The inte relation of snow density with height is also shown graphically. *Subject Headings:* **1. Sno drifting profiles 2. Turbulent diffusion of snow.**—*M.R.*

9.10–252 551.578.

*Thom, H. C. S. (*U. S. W. B., Wash., D. C.*), **Probabilities of one-inch snowfall threshol for the United States.** *Monthly Weather Review*, Wash., D. C., 85(8):269–271, Aug. **195** table, ref., 5 eqs. **DWB, DLC.** Also published as "Manuscript of the U. S. Weather Bureau Aug. 27, **1957.**" 10 p. tables, eqs. **DWB** (M78.4 U587pr)—Following previous wor climatological statistics and computational methods are presented for obtaining the quantiti of first one-in. 24-hr snowfall. These are employed in computing the .05, .10, .30, .90 quantil for 164 United States and Alaskan first-order Weather Bureau stations. (Presented in table.) *Subject Headings:* **1. Snowfall probabilities 2. United States.**—*Author's abstract.*

9.10–253 551.578.

*Federal-State Cooperative Snow Surveys and Water Supply Forecasts, **Summary of sno survey measurements for Colorado and New Mexico, 1953–1957, inclusive.** Fort Collin Colo., Oct. **1957.** 64 p. numerous tables. **DWB** (M78.46 U58saa)—This bulletin lists,

mpact form, the summary of snow depth and water content measurements for snow courses Colorado and New Mexico. The period covered is 1953–1957. Three earlier bulletins vered the period 1936–1952. At the present time there are 132 active snow courses in olorado and 16 in New Mexico. Tables of snow measurements are listed by larger tributary atersheds. *Subject Headings:* **1. Snow surveys 2. Snow depth 3. Water content of snow Colorado 5. New Mexico. I. Chalmers, Kenneth W. II. Young, R. A.**—*From authors' stract.*

9.10–254 551.578.46(47)

*Iveronova, M. I., **Nekotorye zakonomernosti raspredeleniia i rezhima snezhnogo pokrova a gornykh sklonakh v leso-lugovo-stepnom poiase Terskei-Ala-Tau.** [Snow cover distribution and regime on mountain slopes of the forest-meadow-steppe belt of Terskei-Ala-Tau.] *kademiia Nauk SSSR, Institut Geografii, Trudy*, 67:11–36, **1956.** 10 figs., 5 tables, 14 refs. **LC**—This comprehensive study, on the basis of extensive observations of the characteristics the snow cover, includes the following: general features of the snow cover of the forest-meadow-steppe belt of the Terskei-Ala-Tau range, snow cover observations on valley slopes nd analysis of factors on the regime and the distribution of snow cover on slopes. Data e given on the amplitude of variations of the snow cover or the snow cover regime in various alleys. Water reserves of the snow cover of valleys and of the slopes of different exposures, istribution of snow on slopes at different altitudes, the relationship of amount of direct solar adiation impinging upon slopes with decrease of orientation and slope to the amount of direct olar radiation falling upon a horizontal surface, etc. are reviewed. *Subject Headings:* **1. Snow over distribution 2. Snow cover on slopes 3. Radiation on horizontal surfaces 4. Terskei-la- Tau, U.S.S.R.**—*I.L.D.*

9.10–255 551.578.46:061.3

Khmaladze, G. N., **Vsesoiuznoe soveshchanie po snezhnomu pokrovu v gorakh.** [All-nion Conference on Snow Cover in Mountains.] *Meteorologiia i Gidrologiia*, No. 1:61–62, an. **1957. DWB, DLC**—A brief summary of the proceedings of the All-Union Conference on now Cover in Mountains that was held at the Tbilissi Scientific Hydrometeorological Institute uring Oct. 22–25, 1956. Among the 17 papers delivered were the following: **Problem and ethods of snow surveys in the Caucasus** (G. N. KHMALADZE), **Use of linear route surveys in the aucasus** (V. SH. TSOMAIA), **Aerosynoptic conditions for the formation of stable snow cover,** tc. *Subject Headings:* **1. Snow cover conferences 2. Snow surveys 3. U.S.S.R.**—*I.L.D.*

9.10–256 551.578.7:63

Gifu, Japan. Weather Station, **Hail damage in Gifu Prefecture on June 21, 1956.** *Japan. Meteorological Agency, Tokyo, Memoirs of Industrial Meteorology*, 20(1):61–70, Oct. **956.** 4 figs., photos, 2 tables. In Japanese, English summary p. 70. **DLC**—Remarkable damage was caused by a thunderstorm with hail and gust in Gifu Prefecture on June 21, 1956. The damage was observed over a zonal district extending from Kasuga to Tojima, through Kitagata, Gifu, Naka and Inuyama (Aichi Prefecture). The damage to agricultural products was especially heavy. We have investigated this hail damage in regard to the following points: a) distribution of hail damage, b) condition of hail damage, c) condition of hail fall, d) hail damage in the past. *Subject Headings:* **1. Hail damage 2. Gifu Prefecture, Japan.**—*Author's abstract.*

HYDROMETEOROLOGY

See also: **California floods—Dec. 1955,** 9.10–25, 9.10–26; **Flash floods, Mobile, Ala.** (Pierce, Tate), 9.10–27; **Agromet. services, West Germany** (Uhlig), 9.10–68; **Calculating effective catchment areas** (Basin), 9.10–104; **Short range flood forecasting** (Kozik), 9.10–136; **Snow melt runoff forecasting** (Kharshan), 9.10–142; **Hydrologic forecasting** (Mashykov), 9.10–143; **Floods, Garonne Basin** (Fontaine), 9.10–246.

9.10–257 551.579:551.481.1:532.594

*†Gasser, Oswald, **Die Wasserspiegelschwankungen des Bodensees und ihre meteorologischen Grundlagen.** [Variations in the level of Lake Constance and their meteorological causes.] *Germany. Deutscher Wetterdienst, Berichte*, 5(35), **1957.** 24 p. 17 figs., 5 tables,

47 refs. **DWB, DLC**—Describes the geographical position of the Boden See and its infl area, its effect on climate and water balance. This is followed by a discussion of the perio movements of the water level, observations of seiches, daily period of seiches, special weat situations associated with maximum oscillations, water level observations and seiches, aperio oscillations of the water level and water level as an equilibrium condition; inflow into t Boden See—including precipitation and inflow, snow melt and inflow, the relationship betwe atmospheric temperature and snow melt, evaporation, effect of precipitation and snow m upon water, the level of the Boden See for 1951, water balance of the Boden See for 1951, outfl and water level of 1951 as compared with those of other years, the weather situations associa with greatest rivers in water level, the Boden See as a natural water reservoir and forecast of water level, meteorological basis for regulating the water level of the Boden See, applicati of the concepts and knowledge to other water reservoirs, etc. Extensive data are presente *Subject Headings:* **1. Lake level variations 2. Seiches 3. Lake Constance.**—*I.L.D.*

9.10–258 551.57

Kritskii, S. N. and Menkel', M. F.: **Zadachi gidrologii v sviazi s gidrotechnicheski stroitel'stvom v shestoĭ piatiletke.** [Tasks of hydrology relative to hydraulic construction the 6th 5-year plan.] *Meteorologiia i Gidrologiia*, No. 12:9–17, Dec. **1956. DWB, DL** English translation (19 p.) available. **DWB**—The development of the water resources of t U.S.S.R., the increased use of water power in the national economy of the U.S.S.R., the num ous requirements of water, etc. are discussed with particular reference to the needs for creased research in theoretical and applied hydrology. The authors discuss the frequen available knowledge in various aspects of hydrology and the types of research which would particularly useful to the national economy. The discussion covers river flow, especially connection with intermittent flow, annual flow, forecasting of periods of maximum flo floods, etc., extension and improvement of observation stations, cooperation between m teorological stations and hydrological stations, etc. *Subject Headings:* **1. Applied hydrolo 2. Water resources 3. River flow 4. U.S.S.R.**—*I.L.D.*

9.10–259 551.579.1

Kalinin, G. P., **O dobeganii talykh i dozhdevykh vod.** [Meltwater and rainwater runof *Meteorologiia i Gidrologiia*, No. 6:22–28, June **1956.** 2 graphs, ref., 14 eqs. **DWB, DLC**— theoretical mathematical analysis of the relationship between the rate of runoff of meltwa and the factors determining it is developed. It is shown that the accumulations of wa exerts a retarding influence upon meltwater in a manner analogous to the regulation actio of minute lakes or ponds. *Subject Headings:* **1. Snow melt runoff 2. Runoff calculation.** *I.L.D.*

9.10–260 551.57

Onufrienko, L. G., **O faktorakh vesennego stoka.** [Factors of spring runoff.] *M teorologiia i Gidrologiia*, Leningrad No. 2:38–39, Feb. **1956.** 2 tables, 4 refs. **DWB, DLC** Data are analyzed to show that with increasing thawing of snow the layer of thaw runoff a coefficient of runoff increases but on the other hand the increase in snow supply is not t principal factor in reducing the freezing of the soil. *Subject Heading:* **1. Snow melt runo** —*I.L.D.*

9.10–261 551.57

Bose, U. K. (*Met. Office, New Delhi*), **A study on the floods in West Bengal and We Uttar Pradesh during September–October 1956.** *Indian Journal of Meteorology and Ge physics*, New Delhi, 9(1):23–34, Jan. **1958.** 7 figs., 2 tables. **DWB, DLC**—In connecti with the study of extensive floods during Sept. and Oct. 1956 in West Bengal and parts Uttar Pradesh, old records of rainfall dating from 1891 were examined. Several periods heavy rainfall during the period, end of September to beginning of October, were foun Detailed examination of the district rainfall, with the help of standard deviation and coefficie of variation of daily rainfall during the chosen period revealed considerable variability with the district. One case (1922) has been studied further by considering the isohyets during t period of heavy rainfall. In the case of Jamuna floods a few self-recording rain gages in t

mountainous catchment were used to prepare the intensity-pattern. These on comparison with the hydrograph at Tajewala show striking characteristics. Delhi self-recording rain gage records and Jamuna Bridge river gage records have also been examined. It is concluded from the above studies that the heavy rainfalls towards the end of Sept. and early Oct. 1956 were not absolutely unique. Cases of early occurrence of heavy rainfall during the same period are available, thus showing that heavy rainfalls have occurred in the past during the period, end of September and early Oct. when there were no atomic or thermo-nuclear explosions polluting the atmosphere, contrary to a popular view which seems to have gained ground that the 1955–56 heavy rainfalls are unique and direct result of atomic explosions. *Subject Headings:* **1. Flood studies 2. Long period records 3. Heavy rainfall 4. Nuclear explosion effects 5. West Bengal, India 6. West Uttar Pradesh, India.**—*Author's abstract.*

9.10–262 551.579.4(794)

*California. Dept. of Water Resources, **Flood flows and stages in Sacramento and northern San Joaquin Valleys, 1954–1956.** Its *Bulletin*, No. 16, Feb. **1957.** 92 p. (plus 125 p. of tables), 10 plates and 1 map (most fold.). "16th of a series of such reports." **DWB** (M79.4 C153f)—This sixteenth report of a series covering 1913–1956 data on floods, river stages, etc. in the Sacramento and San Joaquin Valleys contains a section (p. 50–54 and numerous folded charts) on the meteorology, precipitation and record floods of the 1955–56 season. Twelve flood hydrographs for the great Dec. 1955 floods compared with previous peak floods, cumulative precipitation curves, an isohyetal chart of N. California, a generalized synoptic chart for N. America and the Pacific for the flood-producing situation, and analysis of flood flow and snow pack (from radioactive telemetering gages) are presented. For abstract on 1950/1952 issues, *see* 5.5–189, May 1954, *MAB*. *Subject Headings:* **1. Floods, California (Dec. 1955) 2. Flood hydrographs 3. Sacramento Valley, Calif. 4. San Joaquin Valley, Calif.**—*M.R.*

9.10–263 551.579.5(52)

Kusakabe, M. (*Central Met. Obs., Fukuoka District*), **Estimation of soil moisture from climatic data.** *Journal of Agricultural Meteorology*, Tokyo, 11(2):41–43, Oct. **1955.** fig., 2 tables, 2 refs. In Japanese; English summary p. 43. **DWB**—To estimate the soil moisture from climatic data, the author decided the field capacity of the soil. When the soil is saturated to the field capacity, 490 mm of water is contained in the soil layer from earth's surface to 100 cm depth. The author evaluates the rate of evaporation from earth's surface as that from water surface. When the earth's surface is covered with dry soil, the rate of evaporation from the earth's surface does not exceed 1 mm per a day. The procedure to estimate the soil moisture from climatic data is shown in a table. Estimated and observed data of soil moisture are shown in a fig. *Subject Headings:* **1. Soil moisture estimation 2. Japan.**—*Author's abstract.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See: **Progress in climatology** (Bartnicki, Kühn), 9.10–48.

CLIMATE OF PARTICULAR PLACES

See also: **History of Arctic expeditions** (Laktionov), 9.10–13; **Climate, S. California** (Aldrich, Meadows), 9.10–16; **Climate, S. Africa,** 9.10–17; **Climate, U.S.S.R.** (Lialikov et al.), 9.10–32; **Climatic atlases, U. S.,** 9.10–35; **Geophysical atlas, Antarctica** (Wilson), 9.10–44; **Ice free airstrips, Brønlunds Fjord, Greenland** (Stoertz), 9.10–50; **Climate, Point Barrow, Alaska** (MacGinitie), 9.10–52; **Climatic analogs, Australia** (Nuttonson), 9.10–96; **Homogeneity of climatic records** (Saito), 9.10–108, 9.10–109.

9.10–264 551.582:551.577(234.21)

§Rebotier, R., **Le climat pluviométrique des Basses Cévennes.** [Rainfall of the Low-Cévennes.] *France. Météorologie Nationale. Monographies*, No. 7, Nov. **1957.** 28 p.

18 figs., 3 tables. **DWB**—Statistical study relative to the distribution of precipitation in t Low-Cévennes (France) and investigation on the favorable conditions for heavy precipitatic These are always accompanied by the same meteorological conditions, and are mainly due relief influence, which is among the preponderant causes. *Subject Headings:* **1. Climate Cévennes 2. Precipitation distribution 3. The Low-Cévennes, France.**—*A.V.*

9.10–265 551.582(491.

*Sundborg, Åke, **Meteorological observations.** (Ch. 6 of Pt. 2 of Hjulström, Fili Sundborg, Åke; Arnborg, Lennart and Jónsson, Jón: **The Hoffellssandur: a glacial outwa plain.**) *Geografiska Annaler*, Stockholm, 37(3/4):176–184, **1955.** 6 figs., 2 tables, 7 re **DLC**—This article contains a general account of the atmospheric circulation over Icelan of temperature, precipitation and climatic change; a description, with the aid of a map, of tl location of the meteorological stations in the research area on eastern Iceland; the weath states and observations during June 1951–Aug. 1952, and the observations at Horfell, Juna Aug. 1951. Meteorological data are presented in graphs and tables. *Subject Heading* **1. Climate of Iceland 2. Iceland.**—*I.L.D.*

9.10–266 551.582.1(49

*Sneyers, R., **Les caractères climatiques de la période 1939–1953.** [Climatic characte istics during the period 1939–1953.] *Ciel et Terre*, 70(9/10):357–379, Sept./Oct., **1954.** figs., 10 tables, 6 refs., 2 eqs. **DLC**—The significant statistical anomalies of various climat elements during 1939–53 and in detail in 1953. *Subject Headings:* **1. Climatic anomali 2. Climate of Belgium 3. Belgium.**—*M.R.*

9.10–267 551.582.2(6

Wood, C. P. and Breen, G. M. (*Directorate of Climatology, U. S. A. F.*), **Winter weathe over Suez.** *Weatherwise*, Boston, 9(6):182, 213–214, Dec. **1956.** 2 tables. **DWB**—Bri notes, with some tabular data, concerning air masses, cloud, precip., humidity, storms, dus khamsin winds, etc. in the Port Said and Suez area. *Subject Headings:* **1. Climate of Sue 2. Suez Canal, Egypt.**—*M.R.*

CLIMATIC CHANGES

See also: **Climatic changes, Baja, Calif.** (Arnold), 9.10–18.

9.10–268 551.583:581.05

Schulman, Edmund (*Univ. of Arizona*), **Tree ring evidence for climatic changes.** (In Shapley, Harlow (*ed.*), **Climatic change.** Cambridge, Harvard Univ. Press, **1953.** p. 209–21 7 figs., 8 refs.) **DLC**—A review of the tree-ring indices now available for the western Unite States and southwestern Canada is presented. The author discusses the relationship betwee mean annual growth and annual rainfall ending in June and water—year runoff ending i September; the climatic variations over a period of 850 years suggested by tree-ring indice in the Colorado basin, the extension of Colorado River chronology to 58 B.C. and dendrc climatic histories for southern California and British Columbia. *Subject Headings:* **1. Dendro chronology 2. Tree ring indexes 3. Climatic variations 4. Colorado River 5. Weste United States 6. Southwestern Canada.**—*I.L.D.*

9.10–269 551.583:551.586:5

Siivonen, Lauri (*Dir., Game Res. Inst., Helsinki*), **On the influence of the climatic varia tions of recent decades on game economy.** *Fennia*, Helsinki, No. 75:77–88, **1952.** 5 figs 14 maps, refs. **DWB**—Summary, based on Finnish hunting license and skin stamping sta tistics and additional game surveys, shows considerable variations in both the abundance o population and geographical distribution of game. Farm game is much more sensitive t climatic variations than forest game, especially to cold winters and deep snow. *Subject Head ings:* **1. Ecoclimatology 2. Animal ecology 3. Climatic variations 4. Finland.**—*A.A.*

9.10–270 551.583.1

Arakawa, H., **Meteorological periodicities of the order of 10–30 years, with special refer ence to the terms of 8, 13 and 24 years.** In Japanese. *Meteorological Society of Japan Journal*, 29(12):419–421, Dec., **1951.** 4 refs. **MH-BH**—*Subject Heading:* **1. Periodicities.**

9.10–271 551.583.13

Trenkle, H., **Eine langperiodische Klimaschwankung um die Jahreswende in Karlsruhe.** [A long periodic climatic variation near the turn of the year in Karlsruhe.] *Baden. Landeswetterdienst, Jahresbericht mit Abhandlungen*, **1951/1952.** p. 185–192. 6 figs., tables. **AWB**—A study of climatic variations in singularities for the pentades 72, 73, 1 and 2. Running temperature means over five years show cold continental periods for 1886–95 and 1936–45 and a maritime warmer period for 1910–35. A significant correlation exists between the pentades 72 and 73 and the Dec. temperature, as well as between the pentades 1, 2 and the Jan. temperature. *Subject Headings:* **1. Singularities 2. Climatic variations 3. Karlsruhe, Germany.**—*A.A.*

9.10–272 551.583.14

Conover, John H. (*Harvard Univ.*), **Climatic changes as interpreted from meteorological data.** (In: Shapley, Harlow (*ed.*), **Climatic change.** Cambridge, Harvard Univ. Press, **1953.** p. 221–230. 6 figs., 11 refs.) **DLC**—Secular changes of meteorological variables can be determined only if homogeneous material is used. Changes in temperature may be apparent and result from changes in method of computing means, shift in site of screen, varying accuracy of the thermometers, urban, botanical, geological, oceanographical factors, etc. In case of pressure, sudden shifts in calibration of barometers must be excluded. For precipitation a dense network of stations is desirable. The feasibility of correlating changes of wind direction with changes of temperature, pressure, and precipitation is tested for the winter months for the periods 1903–1917 and 1928–1937. The changes in the meteorological variables are shown on charts and analyzed. The climatic change studies of WILLETT and LYSGAARD are summarized. *Subject Headings:* **1. Climatic variations 2. Historical climates.**—*I.L.D.*

9.10–273 551.583.2:56

Colbert, Edwin H. (*American Museum of Natural Hist. and Columbia Univ.*), **The record of climatic changes as revealed by vertebrate paleoecology.** (In: Shapley, Harlow (*ed.*), **Climatic change.** Cambridge, Harvard Univ. Press, **1953.** p. 249–271. bibliog. p. 270–271.) **DLC**—An attempt is made to interpret past climatic conditions from the evidence of fossil vertebrates during past geologic ages on the assumption that animals of the past were more or less similar to their modern descendants in physiological requirements and ecological tolerances. An examination of various types of vertebrates and of the distribution of faunas from the Middle Paleozoic to the upper Cenozoic indicates that during most of the earth's history world climates were uniformly warm, and equable but interrupted occasionally by periods of cooling. *Subject Headings:* **1. Climatic changes 2. Historical climates 3. Paleontology.**—*I.L.D.*

9.10–274 551.583.3

Wolfe, Peter E. (*Rutgers Univ., New Brunswick, N. J.*), **Pleistocene-periglacial frost-thaw phenomena in New Jersey.** *New York Academy of Sciences, Transactions*, Ser. 2, 18(6):507–515, April **1956.** 3 figs., 9 refs. **DLC**—Frost-thaw failures consisting of frost-wedges, fillings, festoons, involutions, etc. were studied on the New Jersey coastal plains southeast of New Brunswick and Trenton, N. J., Philadelphia, Pa. and Wilmington, Del., where a periglacial climate characterized by strong winds and extensive frost action prevailed in the pre- Wisconsin interglacial stages. The study contains a description of the location (illustrated by a map), the geological setting and the various frost features; an account of the thermokarst basins and lakes and of their possible origin and a consideration of the age of the basins. *Subject Headings:* **1. Periglacial climates 2. New Jersey.**—*I.L.D.*

9.10–275 551.583:312

†Utterstrom, Gustaf (*Stockholm*), **Climatic fluctuations and population problems in early modern history.** *Scandinavian Economic History Review*, Uppsala, Vol. 1, **1953.** 47 p. table, 113 refs. **DWB, DLC**—The significance of climatic changes as a fundamental factor influencing the rise and decline of economic conditions in Europe between the Middle Ages and the Eighteenth Century is examined. The author reviews the evidence of climatic changes in Europe during this period and correlates this with agricultural yields, famous plagues and

population growth and decline. *Subject Headings:* **1. Climatic changes 2. Populati 3. Europe.**—*I.L.D.*

9.10–276 551.58

Estienne, P., **A travers les périodiques étrangers: géographie physique, météorologie climatologie.** [Physical geography, meteorology and climatology in foreign journals.] *Re de Géographie Alpine*, Grenoble, 44(2):419–425, **1956.** refs. **DWB**—The author reviews length a number of recent Russian, Polish, German, Czech, Italian, Hungarian, Swedish a other articles or monographs covering glacial geology, geomorphology, meteorology, clim tology, hydrology, etc., with emphasis on paleoclimates as evaluated from pollen analys physiography, and other indirect methods. *Subject Headings:* **1. Paleoclimates 2. Revi articles.**—*M.R.*

MICROCLIMATOLOGY

See also: **Soil climate, Algeria** (Vageler), **9.10–24**; **Forest microclimat.** (Shanks), **9.10–201**; **Desert microclimat.** (Williams), **9.10–286.**

9.10–277 551.5

Wagner, Richárd, **A mikroklíma fogalma és módszere a természeti földrajzi kutatásokba** [Microclimate and microclimatological methods in physical geography research.] *Földra Értesítő*, Budapest, 4(4):465–475, **1955. DLC**—The spacial limits of microclimate and t relations of microclimate with the general climate and with the underlying surface and grow are defined. Choice of site for microclimatological research, elements to be observed, instr ments to be used, and comparison of the microclimatological results with general clima data are discussed. *Subject Heading:* **1. Microclimatological research.**—*G.T.*

9.10–278 551.584.3:551.5

*Maruyama, E. and Yamamoto, Y., **Air temperature at depressed grounds.** *Japa Meteorological Agency, Tokyo, Memoirs of Industrial Meteorology*, 20(2):45–49, Jan. **195** 3 figs., 4 tables, 2 refs. In Japanese; English summary, p. 49. Also in: *Journal of Agricultur Meteorology*, Tokyo, 12(4):121–124, March **1957.** 2 figs., 4 tables, 2 refs. In Japanes English summary p. 124. **DWB**—In order to study the microclimate of small depress plots of different size, subjected to the seasonal variation of temperature, the authors set maximum and minimum thermometers provided with small screen shelter at the height of cm above the ground on nearly circular artificial depressions on a flat bare ground chosen as t standard plot. Observations were made from April 1953 to Feb. 1954. The maximum a temperatures of all the depressions are, unexpectedly, much warmer than that of the fl ground, provided the weather is fine, and they become much warmer with the decrease of t diameter of depression, so far as the diameter ranges between 5 and 1. On the other han the nocturnal air temperature is on the depressions much colder than on the standard plo and especially it becomes very cold in winter, when cold air is accumulated at the bottom of t depressions. Figs. show the nocturnal air temperature in depressions becomes colder wi increasing diameter. *Subject Headings:* **1. Ground depression air temperatures 2. Micr meteorological temperature data.**—*Authors' abstract.*

9.10–279 551.584.41:551.556

*†Jensen, Martin, **Shelter effect: investigations into the aerodynamics of shelter and i effects on climate and crops.** Copenhagen, Danish Technical Press, **1954.** 264 p. 241 figs 240 tables, bibliog. p. 248–254. English summaries p. 151–157; 243–247. Danish summar p. 255–264. **DWB, DLC** (SD409.J4)—The causality of the problem of the aerodynami of shelter and its effect upon climate and crops is expressed by the author as follows: "Shelt measures change wind conditions; changes in wind conditions involve changes in other climat factors and certain other factors affecting plant life and so changes will occur in the growth the crops." This comprehensive experimental study (both laboratory and field experiment of the problems consists of four parts and is accompanied by extensive numerical and graphic data and illustrative diagrams. Pt. I contains a brief summary of the equations relating to t atmospheric wind in the troposphere and to laminar and turbulent flow. Pt. II deals wit

ne apparatus used. Detailed descriptions are given of the wind tunnel and measurement of ind velocities in the tunnel; measurement under field conditions of wind velocity, air temperature, dew point, soil moisture and bending strength of straw. Pt. III is concerned with ne relationship between microclimate in fields with crops and crop characteristics. This ection includes a discussion of the influence of wind upon microclimate, a description of the xperimental arrangement to study the effects of climate upon crop yield, the results of climatic easurements such as wind, ground temperature, precipitation and soil moisture in the experimental fields; an analysis of the direct effect of shelter upon transpiration, the effect ofshelter pon heat and water conditions; excess yields in shelter; and threshold values of crops. inally, Pt. IV deals with the aerodynamics of shelter in which the relationships between helter and sheltering objects and the conditions for the use of small scale tests are discussed. he results of experimental studies and theoretical analysis are presented and the dependence f shelter effect on structure of screens, on measuring level and on degree of turbulence, special helter conditions of single screens, systems of hedgerows and screens, woods and plantations nd landscapes. *Subject Heading:* **1. Shelter effects on microclimate.**—*I.L.D.*

9.10–280 551.584.41:551.521.11:551.556.2

Sato, S. (*Kyushu Agric. Exper. Station*), **Calculations on the received solar radiation n the shade of windbreak at Miyazaki City.** *Journal of Agricultural Meteorology*, Tokyo, 1(1):12–14, July **1955.** 3 figs., 2 tables, 6 eqs. In Japanese; English summary p. 14. **DWB**—One of the disadvantages of the windbreak is that the windbreak casts a shadow on the ultivated field. This paper deals with some investigations concerning the windbreak at Miyazaki City (31°56′N, 131°26′E). The calculating methods are as follows: 1) Length (L) nd direction of the forest-shadow. Distance (D) from the forest to the top-line of the shadow. . . Fig. 1, Formula 1) and 2). 2) Time (*T*) when the shadow retards towards the forest, and he direct sunshine begins to arrive at a certain place. . . . Fig. 2. 3) Comparing the duration of sunshine at several places with whole sunshine duration. 4) Comparing the received solar radiation at several places with whole solar radiation. The loss in receiving solar radiation is marked only in the narrow band neighboring the windbreak. *Subject Headings:* **1. Insolation near windbreaks 2. Windbreak effects on insolation 3. Miyazaki, Japan.**—*Author's abstract.*

9.10–281 551.584.61:551.524:628.8

Akai, S., **A meteorological study on heating and the forecasting of room-temperature.** *Journal of Meteorological Research*, Tokyo, 8(10):622–626, Nov. **1956.** fig., table, 7 refs., 31 eqs. In Japanese; English summary p. 622. **DWB, DLC**—For rationalization of air conditioning, it is necessary to study the indoor meteorological conditions, heating methods and the construction of buildings. In the present paper the author deals with these matters theoretically from the meteorological viewpoint, and investigates the intensity of heat source necessary for efficient control of heating and the total heat quantity necessary for heating in relation to the open-air temperature and wind velocity. Further by using the results, the author tries to forecast the room temperature of next morning in the case of natural cooling of the room at night after heating stops. A good agreement of forecast values with observed ones is obtained. *Subject Headings:* **1. Indoor temperatures 2. Heating of houses 3. Room temperatures.**—*Author's abstract.*

9.10–282 551.584.65

Montoriol Pous, Joaquin, **Resultado de las observaciones espeleometeorológicas realizadas durante la exploración de la Sima de los Esquirols (Macizo de Garraf, Barcelona).** [Results of the speleometeorological observations made during the exploration of the Esquirol cave, Garraf Massif, Barcelona.] *Speleon*, Oviedo, 1(3/4):177–185, Dec. 1, **1950.** fig., 2 tables. **DWB**—Temperature (dry and wet), relative humidity and wind data obtained at depths of 25 to 202 m in the Esquirol cave are presented to show the aerodynamic character of this cave. There is a uniform thermal distribution from the "warm" mouth to the "cold" bottom of the cave. The heating of the air on descent is attributed to latent heat of evaporation. At the bottom of the cave the relative humidity is 100%. Pressure readings were not obtained in the deeper parts of the cave as the man carrying the barometer was killed and the instrument unusable. *Subject Headings:* **1. Cave microclimatology 2. Speleometeorology 3. Esquirol Cave, Spain.**—*M.R.*

CLIMATIC CLASSIFICATION

See also: **Alpine met. conf., 4th, 1956,** 9.10–3; **Tropical rain forests** (Goetz), 9.10–14; **Humid tropics research, Ceylon,** 9.10–47; **Climatic analogs, Australia** (Nuttonson), 9.10–96; **Desert microclimat.** (Williams), 9.10–286.

9.10–283 551.5

†Coggins, Robert S. (*Univ. of Adelaide, South Australia*), **Some geographic applications climatic indices.** *Australian Meteorological Magazine*, Melbourne, No. 11:75–82, Dec. 19 19 refs. **DWB**—Notes on various climatic classifications and studies based on the m important systems (KÖPPEN, THORNTHWAITE and PRESCOTT), with a reminder that there probably no universally ideal system, but that the system must be selected to suit the appli tion. The bibliography is a selection from 62 or more papers listed in the original pap *Subject Headings:* **1. Climatic indexes 2. Geographic studies of climate.**—*M.R.*

9.10–284 551.5

Reumert, Johannes, **Vahls Klimainddeling. En Redegørelse.** [Vahl's climatic classific tion: an explanation.] *Geografisk Tidesskrift*, Copenhagen, 48:184–221, **1946/1947.** 7 fig Complete English translation, *Ibid.*, p. 222–252. Appended: reduced reproduction of w map, scale 1–125,000,000, of Vahl's climatic and vegetation zones, in Eckert's projection, co piled by the Geodetic Institute, Copenhagen, with explanations in Danish, English and Frenc **DWB**—VAHL's seven fold zonal classification of the earth's climates which are based up temperature, rainfall and vegetation characteristics is described in detail. It is compar with the climatic classifications of KÖPPEN and THORNTHWAITE and the superiority of VAHL classification is emphasized. *Subject Headings:* **1. Climatic classifications 2. Vahl's clima classification.**—*I.L.D.*

9.10–285 551.585.5:581.9:551.577.

Shantz, H. L. (*Santa Barbara, Calif.*), **History and problems of arid lands developme** (In: White, Gilbert F. (*ed.*), **The future of arid lands.** Wash., D. C. American Associati for the Advancement of Science, **1956.** p. 3–25. fig., 18 refs.) **DLC**—The author discuss the problems of definitions of the arid zone, the climatic characteristics and extent of semiari arid and extremely arid zones and the use of vegetation cover as a measure of aridity; t physiological and morphological adjustments of plants and animals to arid conditions a the ecological means by which they meet drought conditions, namely: drought escape, drough evasion, drought resistance and drought endurance; the use of arid lands by primitive ma with particular reference to the Hopi of North America; dry land farming by modern ma especially in the United States; the extension of deserts under human action; and futu developments in research and technology for the utilization and control of arid regions. *Subje Headings:* **1. Arid zones 2. Vegetation zones 3. Drought resistance.**—*I.L.D.*

BIOCLIMATOLOGY

See also: **Red blood count and altitude** (Murty), 9.10–103; **Effect of climatic variations on game economy** (Siivonen), 9.10–269.

9.10–286 551.586:551.585.53:551.584.

*Williams, C. B., **Some bioclimatic observations in the Egyptian desert.** (In: Institut of Biology, London, **Biology of deserts.** London, **1954.** p. 18–27. 6 figs., 2 tables, 4 refs. **DWB**—This paper summarizes microclimatic observations carried out for periods of eigh days during Aug. 1922, March 23 and Dec. 1923 in Wadi Digla, in the hilly desert southea of Cairo. A summary of most temperature and humidity readings for each period of observa tion obtained in the Stevenson screen, in bush, under large rock surface, etc. and in ten case is given in tables. The observations included also mean maximum, absolute minimum, mea minimum, and mean range. Graphs showing hourly changes in temperature in some of thes localities (white and black bulb thermometer readings), the range of combined temperature and relative humidities covered by hourly observations in the shade and south side of the Wadi and gradually changing temperatures at different levels in the sand during 36 hrs in Aug.

emperature contours at different depths by day, movement of heat in the sand at different imes, and temperature, relative humidity and vapor variations with increasing distance into he caves are presented. It is also shown that the range of dependence of a depth χ is given y the formula $R_\chi = R\alpha^x$ where R—range at the surface and α—constant for particular sand r soil. *Subject Headings:* **1. Desert microclimatology 2. Desert bioclimatology 3. Wadi Digla, Egypt.**—*I.L.D.*

9.10–287 551.586:598.2:016

†Etchecopar, R. D. and Hüe, F., **Données écologiques sur l'avifaune de la zone désertique Arabo-saharienne.** [Ecological data on the avifauna of the Arabo-Saharian desert zone.] *UNESCO Arid Zone Research*, 8:138–163, **1957.** 611 refs. English summary p. 151–152. **DWB** (M86:599.9 U58h)—Effects on bird populations of such arid-zone factors as drought, heat, insolation and wind are considered. Gloger's law (lighter color of plumage in arid zone), Hesse's law (number of eggs increases with distance from hot region) and other laws concerning migration, body size, etc., are discussed. *Subject Headings:* **1. Bird ecology 2. Arid zone effects on birds 3. Bibliography on bird ecology 4. Sahara Desert.**—*G.T.*

9.10–288 551.586:632

Miller, Paul R. (*U. S. Bur. of Plant Industry, Soils and Agric. Engr.*), **The effect of weather on diseases.** *U. S. Dept. of Agriculture, Yearbook*, 1953:83–92. **DLC**—A comprehensive summary of effects of weather on plant diseases. The possible factors affecting disease are light, temperature, rain, snow, humidity, dew, cloud, sunshine, wind, air currents, evaporation and pressure, but heat and moisture are usually the limiting factors. Diseases seriously limit certain crops, but other crops are not much affected by disease. Climate can act as a barrier to spread of a disease as well as (in other cases) to help spread the disease. Different diseases respond to weather at different stages in their cycle. Some of the most serious plant diseases, such as potato and tomato late blight, wheat stem rust, sweet corn bacterial wilt and others, are treated in some detail and methods of control as well as the organization of the plant disease reporting service of the U.S.D.A. are outlined. *Subject Headings:* **1. Climate and plant diseases 2. Plant disease reporting services.**—*M.R.*

9.10–289 551.586:631

†*Nuttonson, Michael Y., **Phenology and thermal environment as a means for a physiological classification of wheat varieties and for predicting maturity dates of wheat, based on data of Czechoslovakia and of some thermally analogous areas of Czechoslovakia in the United States Pacific Northwest.** Washington, D. C., American Institute of Crop Ecology, **1953.** 107 p. 31 figs., 30 tables, 40 refs. **MH-BH**—The method of temperature summation is applied to a study of thermal requirements of various varieties of spring and winter wheat grown in Czechoslovakia and for Kharkov winter wheat grown in northwest United States. Phenological and day degree summation data are given for 21 localities in Czechoslovakia and for two stations in the Pacific Northwest and also photothermal summation data for the former are determined; standard deviations and coefficient of variation are calculated for each locality. The standard analysis of the data suggests that monthly mean temperatures are almost as satisfactory as daily mean temperatures for computing day degree summations; that the date of maturity of winter wheat can be predicted without compiling day degrees from time of emergence, that fall and winter temperatures can be discarded and that March 1 is a suitable starting point as emergence date for these computations. *Subject Headings:* **1. Wheat phenology 2. Phenological data 3. Czechoslovakia 4. Northwest Pacific.**—*I.L.D.*

9.10–290 551.586:577.4

Winterringer, Glen S. (*Illinois State Museum, Springfield*) and Vestal, Arthur G. (*Univ. Illinois, Urbana*), **Rock-ledge vegetation in southern Illinois.** *Ecological Monographs*, Durham, N. C., 26(2):105–130, April **1956.** 13 figs. (incl. photos), 4 tables, numerous refs. **DLC**—In connection with a monograph on cliff-top habitats and vegetation in the Shawnee Hills or Illinois Ozarks, a summary of the climate of the region is presented, taken mainly from JOHN L. PAGE's work (1949) on the climate of Illinois. Effects of climate, especially of heavy rains (washing of plants and soil) or drought and attendant exposure to high daytime tem-

perature, on rock ledge plants is discussed. *Subject Headings:* **1. Ecoclimatology 2. Southe Illinois.**—*M.R.*

ENVIRONMENTAL INFLUENCES

See also: **Glacial climate, Barnes Ice Cap, Arctic** (Orvig), 9.10–87; **Altitude effects on soil temp.** (Shanks), 9.10–201.

9.10–291 551.588.1:551.585

Khromov, S. P., **K voprosu o kontinental'nosti klimata.** [Continentality of climate *Vsesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia,* 89(3):221–225, May/June 195 2 figs., 8 refs., 5 eqs. **DLC**—The author examines critically the continentality formul proposed by GORCZYŃSKI and by N. N. IVANOV and concludes that fundamentally the formu of GORCZYŃSKI is more suitable for characterizing continentality on a planetary scale wh improved in such a way that the value of continentality for the ocean is comparable wi values for land. Accordingly the mean oceanic amplitudes must be replaced by a "pure oceanic amplitude" proceeding from the amplitude of temperature for an oceanic area whi is, either completely or to a maximum degree, removed from the influence of land. Such a oceanic area is the central part of the southern Pacific. The dependence of "purely ocean continentality" upon latitude is given by the equation $A_m = 5.4 \sin \varphi$. The formula for ind of continentality proposed by the author is

$$k = A - \frac{5.4 \sin \varphi}{A},$$

where A is the annual amplitude of temperature at a given place. This formula cannot b used for the equator where $A_m = 0$ and also in the vicinity of the equator where owing to sma values of $A - A_m\, k$ cannot be determined precisely. Computations of k are presented and map showing the distribution of the index of continentality and a graph indicating the d pendence of "purely oceanic continentality" of the annual temperature amplitude upon latitu are presented. *Subject Headings:* **1. Continentality 2. Continental climates.**—*I.L.D.*

9.10–292 551.588.6:551.524.37(77

*Wang, Jen Yu and Suomi, V. E., **The phyto-climate of Wisconsin, Pt. 1, the growin season.** *Wisconsin, Agricultural Experiment Station, Madison, Research Report,* No. May **1957.** 21 p. figs., 7 tables, 8 maps, 32 refs. **DWB**—This first report of a series contain up-to-date data through 1954 from 127 Wisconsin stations of which 60 are representative their surrounding areas. A series of tables show: (1) number of days from last killing fro in spring to the first occurrence in fall and (2) selected minimum temperature data. TH accompanying maps feature frost data and temperatures as controlled by environmental a well as meteorological differences. The influence of soil types on frost formation extends t altitude, steepness, orientation and type of surface vegetation. Probability units and stand ards applicable to growing season are given. *Subject Headings:* **1. Plant climatology 2. Fro data 3. Wisconsin.**—*W.N.*

SYNOPTIC CLIMATOLOGY

See also: **Arctic synoptic climatology** (MacFarlane), 9.10–54.

9.10–293 551.589.

De la Cruz, Hugo and Hernandez, Pedro P. (*both, Weather Bureau, Manila, Philippines*) **Seasonal weather patterns in the Philippines.** *Pacific Science Congress, 8th, Quezon Cit Philippines, Nov. 1953, Proceedings,* Vol. IIA, pub. **1956.** p. 964–968. **DWB**—The season in the Philippines are classified on the basis of prevailing wind systems. Accordingly si classes are established. These are as follows: (1) Northeast monsoon season (Dec. to Jan. (2) Trade wind season (April), (3) Southwest monsoon season (July, Aug. and Sept.) an (4) three transition periods. The weather characteristics of each seasonal class are describe *Subject Headings:* **1. Weather type classification 2. Seasons 3. Wind systems 4. Philippines** —*I.L.D.*

MISCELLANEOUS

SOLAR INFLUENCES

See also: **IGY solar activity obs. networks** (Shapley), 9.10–42; **Tidal oscillations and forecasting** (Takahashi), 9.10–140; **Eclipse effects on sky light polarization** (Cialdea), 9.10–297; **Solar effects on auroras** (Vegard), 9.10–306.

9.10–294 551.590.21

Brier, Glenn (*U. S. W. B.*), **Short-term correlations.** *Colorado. Univ. High Altitude Obs. Inst. for Solar-Terrestrial Research, Technical Report*, No. 1, **1956.** Lecture No. 15. (4 p.) **DWB**—Very brief discussion, trend of which is to convey that the relation between the sun and (1) temperature and (2) pressure is maybe too short-termed to be interpreted otherwise. Further statistical studies however, may resolve. *Subject Headings:* **1. Solar-weather relationships 2. Statistical analysis.**—*W.N.*

9.10–295 551.590.21

Brier, Glen (*U. S. W. B.*), **Some correlations of atmospheric parameters with solar activity.** *Colorado. Univ. High Altitude Obs. Inst. for Solar-Terrestrial Research, Technical Report*, No. 1, **1956.** Lecture No. 14. (4 p.) fig., 6 refs. **DWB**—Statistics and their interpretation generally and in particular to possible solar-weather relationships. Though observational and analysis difficulties in addition to the absence of any physical theory would ask even a perfect correlation, the statistical significance as applied to the problem of solar-weather relationships justifies further studies. *Subject Headings:* **1. Solar-weather relationships 2. Statistical analysis.**—*W.N.*

OPTICAL PHENOMENA

See also: **Mie scattering and refractive index** (Penndorf, Goldberg), 9.10–4; **Computation tables, scattering of light** (Kerker et al.), 9.10–5; **Radio star scintillation** (Dagg), 9.10–167.

9.10–296 551.593

Nasilov, D. N., **Ob odnom redkom opticheskom iavlenii v atmosfere.** [An unusual optical phenomenon in the atmosphere.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 5:488, Sept./Oct., **1955.** ref., eq. **DLC**—On Aug. 7, 1954, standing on a cape projecting into the sea, the author saw the houses of Yevpatoriya reflected southwards on a background of fog although the city itself was in the north. The occurrence of this phenomenon—which is based upon a complex series of light reflections, reflection in droplets, eyes of observer—is explained by means of the rainbow phenomenon. *Subject Headings:* **1. Optical phenomena . Yevpatoriya, Crimea, U.S.S.R.**—*I.L.D.*

9.10–297 551.593.7:551.590.24

Cialdea, R., **La diffusione secondaria della luce durante le eclissi totali di sole.** [Secondary diffusion of light during total solar eclipses.] *Annali di Geofisica*, Rome, 10(1/2):61–70, **1957.** 6 figs., 20 eqs. Italian and English summaries p. 69–70. **DLC**—In this paper the author reports some observations of the polarization of the skylight during the total solar eclipse on Feb. 25, 1952 and June 30, 1954. In order to verify the validity of Hurion's hypotheses, the author calculates the illumination produced by the regions of the atmosphere which are outside the totality zone. These regions realize the scattering ring of the Hurion's theory. But the observations do not agree with the theoretical results. The author attributes this disagreement to the albedo of the terrestrial surface which scatters according to the Lambert's rule and he verifies that this illumination can be so big that it cannot be generally omitted. The author concludes that the Hurion's scheme cannot be sufficient in order to describe the distribution of polarization over the sky. But this scheme can be utilized, if one takes into consideration the two Hurion's sources and a third source, which is formed by a scattering surface parallel to ground. *Subject Headings:* **1. Eclipse effects on skylight polarization 2. Hurion's theory.**—*Author's abstract.*

ELECTRICAL PHENOMENA

See also: **Ionospheric drifts, Brisbane** (Burke, Jenkinson), 9.10–166.

9.10–298 551.594.12:551.576.

Twomey, S. (*Div. of Radiophysics, C.S.I.R.O., Sydney*), **Electric charge separation in su freezing cumuli.** *Tellus*, Stockholm, 9(3):384–393, Aug. **1957.** 2 figs., 2 tables, 12 ref 10 eqs. **DWB, DLC**—It is shown that charges may be separated in large cumuli as a res of negative charging of growing ice particles by collision with supercooled droplets. T magnitude of the effect has been calculated and it has been shown that charges comparal to those involved in thunderstorms can develop, providing the water content and updraug velocity in a cloud are high. The hypotheses lead to conclusions which agree, qualitative and quantitatively, with the known physical characteristics of thunderclouds. *Subj Headings:* **1. Electrical charge separation in cumuli 2. Electrical charges on ice particles.** *Author's abstract.*

9.10–299 551.594.

Dalgarno, A. (*Dept. of Applied Math., Queen's Univ. of Belfast, N. Ireland*), **Charge transf and the mobilities of positive and negative ions in their parent gases.** (In: **The threshold space,** ed. by M. Zelikoff. N. Y., Pergamon Press, **1957.** p. 186–190. 2 tables, 18 ref 25 eqs.) **DLC**—The mobility of a positive or negative ion moving in its parent gas depen almost entirely on the corresponding probability of charge transfer. A simple formula driv elsewhere for cross sections for charge transfer is reproduced and used to demonstrate that t variation of mobility with temperature for an ion in its parent gas is quite different from th for an ion in an unlike gas. *Subject Headings:* **1. Ion mobility 2. Ion charge transfer.** *Author's abstract.*

9.10–300 551.594.221:778.

Malan, D. J., **The theory of lightning photography and a camera of new design.** *Geofisi Pura e Applicata*, Rome, 38:250–260, **1957.** 3 figs., 14 refs., 4 eqs. **DLC**—A theoretical stu of the optics of lightning cameras shows that the focal length as well as the relative apertu of the lens should be considered in the photography of streamers having the dimensions of t stepped leader. Increasing the focal length increases the useful distance range of the came and allows it to be run at higher speeds for near photography. The effects produced on t photographs by variations in the dimensions of stepped leaders, the grain size and speed of t emulsion, the light scattered by rain and the camera speed, are critically examined. In co clusion a camera is described which has a lens of focal length 14 cm and a relative apertu f/2. The film, in the form of a belt, is run between two small drums to keep it flat in the ima field. It has been possible to obtain records of stepped leaders at a distance of 35 km and t camera shows promise of being able to photograph the pilot streamer. *Subject Headin* **1. Lightning photography.**—*Author's abstract.*

9.10–301 551.594.222:551.594.11:551.5

Chalmers, J. A. and Kirkman, J. R., **Relation between point discharge current, potenti gradient and wind speed for an isolated point: second report.** Durham, England. Univ Contract AF 61(514)-743-C, Technical Note 2, July 1, 1955–April 30, **1956.** 5 p. 2 fig 3 refs., eqs. **DWB**—Results of measurements with a point at a height of 34 m agree with tho reported previously (CHALMERS and KIRKMAN, 1955; *see* 8.1–386, Jan. 1957, *MAB*) for point at 27 m. The constant K is approximately proportional to the height and M inverse proportional, as might be expected. Measurements with an agrimeter 7 m below the poi show better correlation with point discharge than do those of potential gradient at 45 m windward, which sometimes display "hysteresis" effects. The constant K shows very goo agreement with that found in measurements of two very different types by CHAPMAN (195 *Subject Headings:* **1. Point discharges 2. Potential gradient 3. Wind effects on point di charges.**—*Authors' abstract.*

9.10–302 551.594.25:551.578

†*Norinder, Harald and Siksna, Reinhards (*both, Univ. of Uppsala, Sweden*), **Experiment study of electrification of snow.** *U. S. Air Force. Cambridge Research Center, Geophysic*

esearch Papers, No. 42:208–221, Nov. **1955.** 8 figs., 3 tables, 22 refs. **DLC**—The electrifica- on of snow was studied by measuring: (1) The charge on snow when poured into a funnel, charge on a target against which snow was blown, 3) charge on the snow after striking the rget, and 4) charge in air caused by the blowing snow (*see* 1953 article in **Tellus** [5.7–202, ly 1954, *MAB*] and 1954 article in **Arkiv för Geofysik,** 2(3):59–89 [6.6–337, June 1955, *MAB*]). Equipment and results of these experiments are illustrated in drawings, graphs and bles. Both small ion counters and large ion counters were used. With the former it was und that small invisible snow particles and small atmospheric ions with large positive charges ere formed during blowing snow. *Subject Headings:* **1. Electrification of snow 2. Ion ounters 3. Electrical charges on blowing snow 4. Snow static.**—*M.R.*

9.10–303 551.594.25

Sivaramakrishnan, M. V. (*Met. Office, Poona*), **Point discharge current, the earth's lectrical field and rain charges during disturbed weather at Poona.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(4):379–390, Oct. **1957.** 10 figs., 5 tables, 14 refs. **DWB, LC**—An analysis of measurements of the current flowing to earth through an insulated point et up at the Meteorological Office, Poona, at a height of 17.8 m together with simultaneous neasurements of potential gradient by a quick-run photographic electrograph during fourteen nunderstorms in 1955 show that point discharge currents of either sign can be represented as ncreasing with the square of the field as found by WHIPPLE and SCRASE for Kew, HUTCHINSON or Durham, CHIPLONKAR for Colaba (Bombay). An advancement of the field change ahead f the corresponding point discharge current is shown during a few thunderstorms at Poona ke the one noticed by Hutchinson for Durham. A comparison of point discharge current neasurements with field strength at Poona (taken typical of tropical region) and Kew (taken ypical of temperate region) shows that there is no major difference in the electrical conditions n the tropical and temperate regions. SIMPSON's 'mirror image' effect is also shown on Poona ecords where the synchronization of the change in the sign of the rain current is more with the eld change rather than with the point discharge current which lags behind the field change. 'reliminary results with four-point discharger show that the total current is more than the urrent from a similar single point for the same field. *Subject Headings:* **1. Electricity of recipitation 2. Thunderstorm electricity 3. Point discharges.**—*Author's abstract.*

AURORAS

See also: **IGY amateur auroral obs., 9.10–37; Geophys. and met. research, Norway, 9.10–71.**

9.10–304 551.594.5:551.510.62

†Agy, Vaughn, **Study of auroral zone attenuation of high frequency radio waves.** U. S. National Bureau of Standards. Boulder Lab., Colo., Contract IA-454, Progress Report, April 1–June 30, 1956. Also Progress Report, July 1–Sept. 30, 1956 (both pub. June 14, **1957.** 2 pieces, each about 7 p. figs., 31 refs. in first report. Also called *NBS Reports*, 5089 nd 5090. **DWB**—Correlation of field strength for reception of 8, 10, 11 and 15 Mc waves etween Washington, D. C., Bismarck, N. D., and Mani, T. H., respectively, and Anchorage nd Fairbanks, respectively, is high enough to indicate that little difference exists (at least id in Sept. 1955–June 1956) between transmission conditions over an auroral and a non- uroral path. Perhaps at times of sunspot maximum or solar flares there would be some ifference in conditions over the 2 types of paths. It is concluded that amount of auroral zone attenuation is much less than was previously supposed. *Subject Headings:* **1. Auroral one attenuation of short waves 2. Ionospheric propagation.**—*M.R.*

9.10–305 551.594.5:551.521.326:539.1

Morel-Viard, Jeannine, **Luminosité aurorale produite par des protons de direction quel- onque.** [Auroral luminosity produced by protons from an arbitrary direction.] *Académie es Sciences, Paris, Comptes Rendus*, 243(3):292–295, July 16, **1956.** fig., 6 refs. **DLC**—A eam of monokinetic protons is considered, which enters the atmosphere at an arbitrary ngle to the line of power of the geomagnetic field. The luminosity associated with each value angle of incidence is calculated as a function of altitude and from this the curve of total

luminosity is derived. *Subject Headings:* **1. Auroral luminosity 2. Protons.**—*Trans. author's abstract.*

9.10–306 551.594.5:551.5

Vegard, Lars (*Physical Inst., Oslo Univ.*), **Phenomena caused by solar X-rays and pr erties of the solar electric ray bundles producing the aurorae.** (In: **Solar eclipses and ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, P gamon, **1956.** p. 300–301. ref.) **DWB**—Brief account of the effects on the terrestr atmosphere of solar electric ray bundles. Electron rays appear to dominate auroral productio while the proton-flux influences the spectral composition of auroral luminescence. Distu ances in the ionosphere produced by the ray bundles are considered. *Subject Headin* **1. Solar electric ray bundles 2. Solar effects on auroras.**—*Authors' abstract.*

9.10–307 551.594.

†Nicholls, R. W., **Final report.** Western Ontario. Univ. Dept. of Physics, Molecu Excitation Group. Contract AF 19(122)-470, June 30, **1956.** 105 p. 4 tables, 101 refs. + titles of papers published or presented at conferences, numerous eqs.—Experimental, theoreti and interpretative researches of the Molecular Excitation Group, University of Weste Ontario during 1951–1956 are reviewed in detail and contributions which the group has ma to the knowledge of molecular excitation processes and basic molecular properties are e phasized. Information is also tabulated in three appendices on a) members of the Molecu Excitation Group, b) publications and orally presented papers on the work of the group a c) scientific reports issued by the group. *Subject Headings:* **1. Auroral research 2. Airgl research 3. Molecular excitation studies.**—*From author's abstract.*

ACOUSTICAL PHENOMENA

See: **Acoustical obs. of falling bodies** (Groves), 9.10–151.

ART II. RECENT LITERATURE ON GEOMAGNETISM

Compiled by: *Mary L. Rice and Robert Panara*

INTRODUCTION

Although ancient and medieval men were familiar with the behavior of the lodestone and its aluable aid to mariners, it was not until the 17th century that the true causes for this remarkable nomenon became known. In 1600 WILLIAM GILBERT, in his book, *De Magnete*, advanced the othesis that the earth is a great magnet, a fact which was subsequently confirmed by the studies HELLMANN and HALLEY. Thereafter, many noteworthy observations and discoveries were made n attempt to explain the manner in which the earth's main field and its secular change is produced, minating in the important dynamo theory advanced by W. M. ELSASSER and SIR EDWARD LLARD.

Continuing interest in this field of scientific investigation resulted in its inclusion as one of the ciplines of the IGY. The study of the earth's magnetic field has from the beginning been one of disciplines of geophysics closely related to meteorology. More and more fields of common erest to both are being investigated, namely, ionospheric, cosmic ray and auroral phenomena, and s important that discoveries and observations in these fields be organized in such a way that they benefit both disciplines.

The unpublished material on geomagnetism in our files has been organized into two bibli- aphies. In this (October) bibliography, all aspects of geomagnetism, except the transient gnetic effects (short period variations, fluctuations and storms), have been covered. The remain- material will be included in the bibliography in the November issue of *MAB*. The material been arranged according to the major subdivisions of the Universal Decimal Classification for omagnetism (1957 ed.), as follows:

550.380—Geomagnetic techniques, methods and equipment
550.383—Underlying plan. Organic conceptions
550.384—Origin and secular change of the field
550.385—Transient magnetic effects: Variations, fluctuations and storms. (For statistical and collateral aspects, *see* 550.386)
550.386—Magnetic activity, fluctuations, quasi-persistence, etc.: statistical and collateral aspects
550.387—Telluric electricity, earth currents. (For private use, subdivide as 550.37)
550.388—Overhead activation phenomena of ionosphere, luminous manifestations, etc. (For electrical phenomena of the lower atmosphere, *see* 525.23/24 and 551.594)
550.389—Magnetic surveys, charts, observatory results

In order to facilitate the location of articles on various subjects and areas, the following subject l geographical outline is provided:

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GENERAL WORKS

9J–1 550.38:523.74

†Ferraro, V. C. A. (*University College, Exeter, Eng.*), **Magnétisme solaire et cosmique.** [Solar cosmic magnetism.] *Belgium. Observatoire Royal de Belgique, Monographies,* No. 1, **1950.** . 24 figs. 62 refs., eqs. **DLC** (Q6851.B83)—A substantial monograph on the many theoretical ects, especially quantitatively, of solar and stellar magnetism, beginning with the discovery of magnetic field of sunspots and treating of the magnetic flux from sunspots, solar "noise," electric ionic properties of the solar atmosphere, the theory of solar eruptions of GIOVANELLI, etc. and g on with the radial limits of the solar magnetic field, the theory of ALFVÉN, H. A. WILSON, etc. including the magnetic field of the earth, planets, nebulas and interior of earth. It is stated that y body of rotation which has an electric charge also has a magnetic field. *Subject Headings:* **eomagnetism 2. Solar magnetism 3. Sunspots.**—*M.R.*

9J–2 550.38(02)

Kalashnikov, Alekseĭ Georgievich, **Zemnoĭ magnetizm i ego prakticheskie primeneniia.** [Terrial magnetism and its practical application.] Moscow, Izdat. "Znanie," **1952.** 31 p. 19 figs. **C** (QC815.K3)—History of knowledge of the earth's magnetic field, instruments, methods of ervation and investigations, variations between land and sea, surface and depth (mines) from tury to century, with solar variations, etc. and anomalies are given. Causes and practical value adio communication and studies of ionosphere are presented. *Subject Headings:* **1. Terrestrial gnetism 2. Textbooks.**—*M.R.*

9J–3 550.38(09)

†Körber, Hans-Günther (*Berlin*), **Alexander von Humboldts und Carl Friedrich Gauss' organisatorisches Wirken auf geomagnetischem Gebiet.** [A. von Humboldt's and C. F. Gauss' anization activities in the field of geomagnetism.] *Forschungen und Fortschritte,* Berlin, 32(1): , Jan. **1958.** 47 refs. **DLC**—The contributions of HUMBOLDT and GAUSS to geomagnetism as cience and their roles in the establishment of organizations for geomagnetic investigations are cribed. HUMBOLDT's interest in magnetism had begun already before his voyage to South erica where he carried out numerous observations on inclination, declination and intensity of restrial magnetism and established the diminution of total intensity from the magnetic pole to the gnetic equator. Towards the end of the 1820's, HUMBOLDT had succeeded in establishing an ormal cooperative network of geomagnetic observers. HUMBOLDT's observational techniques, the trumentation employed, establishment of fixed observation periods and extension of network o Russia are described. In the 1830's, GAUSS intensified his interest in geomagnetism under the nulus of HUMBOLDT. GAUSS was instrumental in founding a magnetic observatory at the Uniity of Göttingen (1883) and then in cooperation with WEBER he organized the Göttingen Geognetic Association which became the center of a magnetic observation network that extended m Germany to Scandinavia, North America (Toronto, Philadelphia) and even to temporary tions in the Antarctic (J. C. Ross Expedition, 1838–1843). The details of the organization of se networks, the type of observations, the instrumentation, the publication of the results, etc. are cribed. *Subject Headings:* **1. History of geomagnetism 2. Geomagnetic research.**—*I.L.D.*

9J–4 550.38:538.69:532.59

Price, A. T., **Magnetic properties of the earth's interior.** *Nature,* London, 172(4383):786–787, t. 31, **1953.** Also: Ferraro, V. C. A., **Magneto-hydrodynamics.** *Ibid.,* 176(4475):234–237, Aug. **1955. DWB**—Reports of discussion at British Association. SIR EDWARD BULLARD discussed rmoelectric and dynamo theories of magnetic field, favoring the second. A. T. PRICE described effect of ionosphere currents on short period magnetic fluctuations, and increase of conductivity h depth. J. HOSPERS described geological evidence for repeated reversals of main field at invals of $2–5 \times 10^5$ yrs. The magnetic evidence is against continental drift in past 20 million yrs. J. LOWES favored thermoelectric theory. The second paper is an account of a discussion at the yal Society on May 5, 1955. It dealt with motion of a conducting fluid in a magnetic field, e.g. rents in the ionosphere and solar atmosphere. The aurora and equatorial electrojet are other mples. The discussion also covered toroidal fields, generation of magneto-hydrodynamic waves

in rare ionized gases, hydro-magnetic turbulence (with exchange of energy between velocity and magnetic field), etc. Calculation of the acceleration of cosmic-ray particles by the gal magnetic field gave an acceleration time of 10^6 yrs, comparable with the mean life of the ener particles. *Subject Headings:* **1. Magnetic field theories 2. Magneto-hydrodynamics 3. Co rays 4. Ionosphere 5. Electrojet.**—*C.E.P.B.*

9J–5 55

Roberts, Elliott B. and Knapp, David G., **Geomagnetism.** *Alaskan Science Conference, W D. C., Proceedings*, 1950:69–70, **1951. DWB**—Geomagnetic research in Alaska aims at determi the existence of a second North Magnetic Pole and the study of short time magnetic fluctuati and the magnetic storms. A brief discussion of the relationship between the earth's magnetism auroral zones and the ionosphere is presented. *Subject Headings:* **1. Geomagnetic studies 2. Ala** —*I.L.D.*

9J–6 550.38

†Slaucitajs, Leonidas, **El origen físico del campo geomagnético.** [Physical origin of the magnetic field.] *La Plata. Universidad Nacional. Observatorio Astronómico, Publicaciones, Especial*, No. 19, **1954.** 31 p. 55 refs. **DWB**—A systematic review of the theory of origin, secular and other variations, of the geomagnetic field based on extensive literature. Local, diu periodic, irregular, and height variations are considered, as well as those in geological time. *Su Headings:* **1. Geomagnetic field bibliographies 2. Geomagnetic field variations 3. Origin of geomagnetic field.**—*M.R.*

THEORY

9J–7 550.3

Bhattacharyya, Bimal Krishna (*Indian Inst. of Tech., Kharagpur, India*), **Electromagn induction in a two-layer earth.** *Journal of Geophysical Research*, Wash., D. C., 60(3):279–: Sept. **1955.** fig., 5 refs., numerous eqs. **DLC**—The problem of determining the induced components outside a horizontal two-layer earth has been tackled from a theoretical point of v The expressions obtained have been applied to evaluate the induced magnetic field due to an o lating magnetic dipole on the surface of the earth. Two separate cases have been considered, example, (1) two layers of nearly equal conductivities, and (2) a conducting layer over an insula medium, and the formulas have been reduced to a form amenable to numerical integration. *Su Heading:* **1. Magnetic fields.**—*Author's abstract.*

9J–8 55

†Blacket, P. M. S., **A negative experiment relating to magnetism and the earth's rotation.** *R Society of London, Philosophical Transactions, Ser. A, Math. and Physical Sciences*, 245(897):309–3 Dec. 16, **1952.** 20 figs., 13 tables, 78 eqs. bibliog. p. 369–370. **DWB**—The author tested hypothesis that the magnetism of rotating astronomic bodies (including the earth) might be to their rotation by seeking a magnetic field from a 10×10 cm gold cylinder at rest in the laborat A sensitive magnetometer was specially designed, but no such field as is predicted by the Schus Wilson hypothesis was found. The magnetometer proved very suitable for measuring remar magnetization of weakly magnetized sedimentary rocks. *Subject Headings:* **1. Rotation of the ea 2. Geomagnetic instruments.**—*From Author's abstract.*

9J–9 550

Bostick, Winston H.; Weintraub, Harold and Levine, Morton A., **Diffusion of a plasma acr an inhomogeneous magnetic field.** Tufts College. Dept. of Physics, Research Laboratory Physical Electronics, Contract AF 19(122)-89, Scientific Report, No. 11, Sept. 15, **1953.** 13 p. figs., 14 eqs. Mimeo. *Subject Headings:* **1. Magnetic field theories. I. Tufts College. Dept. Physics II. Contract AF 19(122)-89.**

9J–10 550.383

Bullard, Sir Edward, **The stability of a homopolar dynamo.** *Cambridge Philosophical Soci Proceedings*, 51(4):744–760, Oct. **1955.** 7 figs., 2 tables, 9 refs., 34 eqs. **DWB**—The stabil of the self-exciting disk dynamo is considered. If there is no electrical load in parallel with the f coil and no friction at the axle, the dynamo can perform oscillations of constant amplitude about state of steady motion. Viscous forces on the axle cause the dynamo to settle to a steady moti A parallel load may have an effect similar to that of viscous forces or may cause the oscillati to grow without limit. With both a parallel load and viscous forces, the amplitude of the oscillati is bounded. Possible analogies between these results and the motion of a body of electrically c ducting fluid in a magnetic field are discussed. The main applications are astronomical and g physical. *Subject Heading:* **1. Dynamo theory of magnetic field.**—*Author's abstract.*

9J–11 550.38

Chopra, K. P. (*Physics Dept., Delhi Univ., India*), **Magnetic fields in a conducting fluid sphere volume currents.** *Journal of Geophysical Research*, Wash., D. C., 62(4):573–579, Dec. **1957.** fs., 50 eqs. **DLC**—The study of force-free and other equilibrium configurations of magnetic s in a conducting fluid sphere, with volume currents flowing in the interior of the sphere, forms subject matter of this note. In Pt. I, assuming the electrical conductivity of the sphere to be ite, the general conditions governing the force-free and other equilibrium fields are derived, and solutions obtained. It is found that a force-free field must be a suitable combination of a idal and a toroidal part. The magnetic energy is equally divided in its poloidal and toroidal ponents. Pt. II of this note deals with the case of finite electrical conductivity. Here, the ibility of a current distribution is explored such that the corresponding magnetic field does not y with time. It is concluded that it is difficult to imagine a poloidal configuration of the magnetic , whereas a purely toroidal nondecaying magnetic field is certainly possible. *Subject Heading:* **Magnetic field theories.**—*Author's abstract.*

9J–12 550.38

Errulat, F., **Was ist über die Ursache des Erdmagnetismus bekannt?** [What is known about ause of geomagnetism?] *Umschau*, 52(5):129–131, March 1, **1952.** **DLC**—A simple discussion heory of geomagnetism. A. SCHUSTER explained variations of magnetic field by tides in the sphere and irregular changes by charged corpuscular radiation. 99% of permanent field is due terior of earth, but this is too hot for magnetism to persist. Magnetic axis is only $11\frac{1}{2}°$ from tion axis, and hypotheses to account for this are discussed but all present difficulties. *Subject ding:* **1. Magnetic field theories.**—*C.E.P.B.*

9J–13 550.38 523.7

Haalck, H., **Zur Frage der Erklärung des erdmagnetischen Kernfeldes und des allgemeinen gnetismus der Himmelskörper.** [On the question of the explanation of the nuclear magnetic and of the general magnetism of heavenly bodies.] *Beiträge zur Geophysik*, 62(1):1–8, **1952.** fs., 7 eqs. **DLC**—A new theory of stellar magnetism is developed. It is shown that a strongly zed hot rotating cosmic mass must have a magnetic field due to thermokinetic motion of the electrons, which agrees with the observed fields of the earth and sun. Possibility that magnetic of sunspots may result from nuclear processes inside the sun is discussed. *Subject Headings:* **tellar magnetism 2. Sunspot effects 3. Terrestrial magnetism.**—*C.E.P.B.*

9J–14 538.6:523.2:550.38

Lippmann, Bernard A., **The decay of magnetic fields.** New York Univ. Inst. of Mathematical nces, Contract AF 19(604)-926, Research Report, MH-2, May **1955.** 16 p. 4 refs., eqs. Also **The decay of a stellar magnetic field.** *Ibid.*, Research Report, MH-3, June **1955.** 12 p. e, 4 refs., eqs.—The first report discusses the decay of a system of currents in a (bounded) on of finite conductivity, assuming that the decay is very slow. The chief results are a set of r-related (vector) extremum principles for calculating the decay times associated with regions rbitrary shape and conductivity. These expressions differ, according as the electric field vector, magnetic field vector, or both, are permitted arbitrary variations. The decay times are shown e bounded from above; therefore, the values obtained from the variational principles approach exact decay times from below, and the stationary property corresponds to the theorem that the t field makes the decay time a maximum (LENZ's) law. A vector iterational procedure, general- g the standard procedure in scalar problems, is discussed, and it is pointed out that two-dimen- al decay problems also may be treated by conformal mapping. A numerical application is the ect of a companion report, wherein the decay of the solar magnetic field may be computed from ariational principle based on Lenz's law: i.e., since the fields resist any changes, they adjust nselves to make the decay time a maximum. A variational calculation of the decay time asso- d with one mode of the solar magnetic field has been made and compared with an exact value ined by WRUBEL. To the accuracy of the calculation, a simple, practically constant, trial tion, plus one iteration, reproduces the exact result identically. *Subject Headings:* **1. Magnetic decay. 2. Sun's magnetic field.**—*Author's abstracts.*

9J–15 550.38

Macht, Hans G., **Die Potentialanteile zweiter und höherer Ordnung des Erdmagnetfeldes, I.** e potential components of second and higher order of the geomagnetic field, Pt. 1.] *Beiträge Geophysik*, 62(2):127–153, **1952.** 13 figs., table, 16 refs., 9 eqs. **DWB**—This comprehensive retical work sets out the geographical and geomagnetic system of coordinates and discusses the sical interpretation of geomagnetic potential as an abstract multipole. BARTEL's representation n excentric dipole is discussed, but it is concluded that the members of third and higher order ue mainly to inhomogeneities in the earth's crust. *Subject Heading:* **1. Terrestrial magnetism.** *E.P.B.*

9J–16 5.

Macht, Hans G., **Die Potentialanteile zweiter und höherer Ordnung des Erdmagnetfeldes,** [The potential components of second and higher order of the geomagnetic field, Pt. 2, Sectio *Beiträge zur Geophysik*, 62(3):222–247, **1952.** 13 figs., 30 eqs., ref. **DWB**—This part discusse spherical harmonic components of various possible models of the geomagnetic field due to de current systems in the interior. *Subject Heading:* **1. Terrestrial magnetism.**—*C.E.P.B.*

9J–17 5

Macht, Hans G., **Die Potentialanteile zweiter und höherer Ordnung des Erdmagnetfeldes.** I [The potential components of second and higher order in the geomagnetic field. Pt. 2, Sectio *Beiträge zur Geophysik*, 62(4):288–301, **1952.** 5 figs., 2 refs., eqs. **DWB**—In Section 2, the se order component (planetary basic field) is treated as an asymmetric anomaly originating deep i earth's interior. The magnetic field of the Northern Hemisphere is 2.5% stronger than of S E. Hemisphere 26.5% stronger than of W. The asymmetry is shown especially by the mag equator. Components of higher order define regional anomalies. *Subject Heading:* **1. Terres magnetism.**—*C.E.P.B.*

9J–18 551.510.535:551.557.2:551.5

Maeda, Hiroshi (*Geophysical Inst., Kyoto Univ.*), **Horizontal wind systems in the ionosp *E* region deduced from the dynamo theory of the geomagnetic *Sq* variation, Pt. 1, Non-rot earth.** *Journal of Geomagnetism and Geoelectricity*, 7(4):121–132, Dec. **1955.** 5 figs., 2 table refs., eqs. Also: Kato, Susumu (*Electronic Engineering Inst., Kyoto Univ.*), . . . **Pt. 2, Rot earth.** *Ibid.*, 8(1):24–37, March **1956.** 9 figs., 2 tables, 11 refs., 25 eqs. **DWB**—In Pt. 1 zontal wind systems in the ionospheric E-region are obtained from the dynamo theory of the daily magnetic variation on quiet days, for the case of a nonrotating earth. It is found tha main harmonic term of ionospheric wind velocities necessary to produce the quiet-day mag variations is not semi-diurnal, but diurnal. The diurnal amplitude is about 30 m/sec and the s diurnal one is about 10 m/sec at low latitudes. The semi-diurnal component is nearly in phase that of winds on the ground derived from the barometric pressure variation, and its tidal amplifica is estimated as about 50. On the basis of these ionospheric winds, the vertical drift velociti electrons in the F-region are estimated. In Pt. 2, horizontal wind systems in the ionospher region are deduced from the dynamo theory by using the same total electric field as in Pt. 1. In the effect of the Coriolis force is taken into consideration and a further study is made about the motion in the E region. The wind velocity is obtained by solving the equation of motion of atmosphere for the rotating earth simultaneously with the dynamo equation. It is shown Pt. 1 that the diurnal wind motion predominates over the semi-diurnal one in the E region and semi-diurnal pressure variation is almost in phase with that observed at the ground. The conspic differences in the results between Pt. 1 and Pt. 2 are: (1) The diurnal pressure variation in t region reaches its maximum value at about 7 p.m. local solar time in Pt. 2 instead of at 9 a.m. Pt. 1. (2) Amplification of the semi-diurnal pressure variation in the E region is estimated t 25∼30 at low latitudes in Pt. 2 instead of 50 as in Pt. 1. The vertical drift velocity in the F2 re is calculated by using our wind systems. In Appendices the mathematical consideration is g to our treatment. *Subject Headings:* **1. Horizontal wind systems 2. Magneto-ionic theory region 4. Diurnal pressure variations 5. Semidiurnal pressure variations 6. Ionospheric wi** —*Authors' abstract.*

9J–19 551.10.535:551.5

Maeda, Hiroshi (*Dept. of Earth Science, Yoshida College, Kyoto Univ.*), **Horizontal wind syst in the ionospheric *E* region deduced from the dynamo theory of the geomagnetic *Sq* variation, P** *Journal of Geomagnetism and Geoelectricity*, Tokyo, 9(2):86–93, **1957.** 6 figs., 11 refs., 3 eqs. **D** Also: Kato, Susumu, **Horizontal wind systems . . . Pt. 4.** *Ibid.*, p. 107–115. 3 figs., 11 r 16 eqs. **DWB**—In Pts. 1 and 2, ionospheric wind systems were deduced from the geomagneti variations for the mean solstice. In order to compare our results with observation, however, still necessary to obtain the wind systems for the solstitial seasons. In this paper, wind system summer and winter hemispheres are deduced from the *Sq* data. It is shown that the diurnal w component has greater magnitude in summer than in winter; whereas the semi-diurnal compo has smaller magnitude in summer than in winter over most of the hemisphere, and that in sum hemisphere the diurnal wind component is greater than the semi-diurnal one; whereas in wi hemisphere the former is more or less smaller than the latter. A comparison between our res and observed ionospheric winds is made. In Pt. 4, the wind systems in both Northern and Soutl Hemispheres in the solstice season are obtained. The wind systems thus obtained represent actual state, instead of the mean state as in Pt. 1 and 2 (*see* 9J–18), in the solstice season. In P the effect of the Coriolis force is taken into account and an advance is made in the treatment in P where the wind velocity is simply assumed to be irrotational. It is shown, as in Pt. 3, that in sum

diurnal wind motion is predominant over the semi-diurnal, whereas in winter the velocity of the ner is almost the same as that of the latter. Further the diurnal wind velocity is greater in mer than in winter and the semi-diurnal wind velocity is somewhat smaller in summer than in ter. Some differences are found between the results of Pt. 3 and 4. However, more observa- al material than available at present must be accumulated before discussing these differences. ject Headings: **1. Ionospheric winds 2. Dynamo theory of ionosphere 3. E layer horizontal ds 4. Diurnal wind velocity variations.**—*Authors' abstracts.*

9J–20 550.38

Mauersberger, P., **Berechnung der Höhenabhängigkeit geomagnetischer Normalfelder.** [Cal- tion of the dependence of the geomagnetic normal field upon height.] *Beiträge zur Geophysik*, pzig, 66(1):46–57, **1957.** 2 tables, 3 refs., 23 eqs. German and English summaries p. 46. **DWB** upposing the existence of a potential only by simple computation and without further measure- nt, the usual normal values of all "elements" of the earth's main magnetic field are "completed" Taylor-series in the differences of the geographical latitude and longitude and the height above level between any point and the "reference point." The possibility of some practical use of n a "generalized" normal value is discussed, and the "Magnetische Reichsvermessung 1935,0" Germany is "completed" in the sense mentioned above. *Subject Heading:* **1. Geomagnetic normal 1.**—*Author's abstract.*

9J–21 550.38:532.5:523.7

Parker, E. N. (*Enrico Fermi Inst. for Nuclear Studies, Chic. Univ.*), **Sweet's mechanism for rging magnetic fields in conducting fluids.** *Journal of Geophysical Research*, Wash., D. C., 4):509–520, Dec. **1957.** 4 figs., 5 refs., 33 eqs. **DLC**—SWEET's mechanism for the merging wo oppositely directed magnetic fields in a highly conducting fluid is investigated in a semi- ntitative manner. It is shown that two oppositely directed sunspot fields with scales of 10^4 km ld be merged by SWEET's mechanism, if shoved firmly together, in about two weeks; their normal rdiffusion time would be of the order of 600 yrs. It is suggested that SWEET's mechanism may be considerable astrophysical importance: It gives a means of altering quickly the configuration nagnetic fields in ionized gases, allowing a stable field to go over into an unstable configuration, sequently converting much of the magnetic energy into kinetic energy of the fluid. *Subject adings:* **1. Magnetic fluid dynamics 2. Astrophysics.**—*Author's abstract.*

9J–22 550.38

Piddington, J. H. (*Div. of Radiophysics, C.S.I.R.O., Univ. Grounds, Chippendale, N.S.W.*), **e Crab nebula and the origin of interstellar magnetic fields.** *Australian Journal of Physics*, lbourne, 10(4):530–546, Dec. **1957.** 2 figs., 22 refs., 8 eqs. **DLC**—Electromagnetic effects in Crab nebula have been investigated with the following conclusions: 1) No appreciable proportion the present central magnetic field could have passed in or out through the surrounding ionized ernova shell during its 900 yrs life. 2) A limitation of the generality of the virial theorem of ANDRASEKHAR and FERMI (1953) is mentioned and some consequences: the upper limit of magnetic d strength in a star must, in general, be reduced below their estimate. The theorem does not ear relevant and should not be used in the case of fields which fall off slowly beyond the photo- eric surface. Force-free fields seem improbable in nature, particularly in relation to the Crab ula. 3) The nebular magnetic field was not formed from the general interstellar field, nor by bulence in the supernova shell, nor was it in existence at the time of the explosion. 4) The main d has been created during the expansion as complete loops of magnetic force, within the shell linking neither the shell nor the central star. The average rate of generation of magnetic energy ome 10^4 times the total output of solar energy and must derive more or less directly from nuclear rgy. 5) A significant part of the galactic magnetic field may have originated inside supernova lls. 6) The mass of the expanding supernova shell is probably about one solar mass. 7) Irregular tions seen in the nebula are hydromagnetic waves causing a compression of the magnetic field h consequently enhanced light emission. 8) The cosmic rays in the nebula are accelerated by dromagnetic waves according to the process of statistical acceleration. A significant fraction of galactic cosmic rays may originate in this way; not with the supernova explosion itself but sub- uently within the space between the star and the shell. 9) The nebular magnetic field may be erated by the central star spinning, the energy and angular momentum being supplied by fast rticles ejected from the star. A somewhat similar process may be responsible for stellar and er cosmic magnetic fields. *Subject Headings:* **1. Interstellar magnetic fields 2. Magnetic field ories.**—*Author's abstract.*

9J–23 550.38

Rikitake, Tsuneji, **The electrical state of the earth's interior and the origin of the earth's main gnetic field.** *Geofisica Pura e Applicata*, 22(1/2):37–41, Jan./Mar. **1952.** 3 figs., refs. In

English. **DLC**—The earth's present magnetic field is supposed to be a result of an inductive in action between fluid motion and the magnetic field of the earth's core. The ELSASSER-BULL theory is the most reasonable, and agrees with both physical and geophysical observations. I supposed that the earth's core is composed of highly conductive iron and nickel. The crust ha shielding effect which is very pronounced for short period variations, but the secular changes (yrs or more) penetrate to the earth's surface. *Subject Headings:* **1. Magnetic field origin 2. M netic secular variations 3. Elsasser-Bullard theory.**—*M.R.*

9J–24 550.38:5

Snyder, W. and Helliwell, R. A. (*Stanford Univ., Stanford, Calif.*), **Universal wave polariza chart for the magneto-ionic theory.** *Journal of Geophysical Research*, 57(1):73–85, March 19 7 figs., table, 3 refs. **DLC**—The expression for complex polarization given by the magneto-id theory has been plotted on the complex plane, using normalized parameters related to ioniza density and collisional frequency. BOOKER's definition of ordinary and extraordinary rays is u This results in the entire realm of ordinary polarizations lying inside the unit circle. The symme of the chart is such that all desired information can be extracted from the first quadrant, whic plotted in detail. Since experimental data are obtained in the form of ellipticity and tilt an another chart has been included relating these quantities to the same normalized parameters appear on the complex polarization chart. To complete the graphical presentation, a nomogr has been included that aids in converting the normalized parameters on the two polarization p to the corresponding ionization density and collisional frequency. *Subject Headings:* **1. Magne ionic theory 2. Nomograms 3. Wave polarization charts.**—*Authors' abstract.*

9J–25 550.381:55

Takeuchi, Hitoshi and Shimazu, Yasuo (*Geoph. Inst., Tokyo Univ., Japan*), **On a self-exci process in magneto-hydrodynamics.** *Journal of Geophysical Research*, 58(4):497–518, Dec. 19 fig., 8 tables, 9 refs., eqs. **DLC**—In connection with the convection-current model proposed E. C. BULLARD, the problem here considered is whether the magneto-hydrodynamical equati have a solution representing the self-exciting process which is appropriate to the model. In § 2, general expressions for the magneto-hydrodynamical couplings are obtained. In § 3, using results in § 2, the problem is reduced to solve (3.6) under the boundary conditions (3.3). T eigen-value problem for $4\pi kaV$ (k is the electric conductivity, a the radius of the earth's core, and V fluid velocity) is solved in an approximate way. In § 4 and § 5, this approximate solution is sho to be good enough for studying the present problem. The results obtained in this paper show t such a self-exciting dynamo is possible by which the earth's main magnetic field is produced a maintained. *Subject Headings:* **1. Geomagnetic theories 2. Terrestrial electricity 3. Magne hydrodynamics.**—*Authors' abstract.*

9J–26 550.

Vestine, E. H. (*Terrestrial Magnetism, Carnegie Inst., Wash., D. C.*), **Some theoretical proble in geomagnetism.** *Journal of Geophysical Research*, Wash., D. C., 61(2, Pt. 2):368–369, June 19 **DLC**—Recent data show that 99% or more of the main geomagnetic field originates within the ea and the sources cannot be deeper than the estimated depth of singularities, such as dipoles, and hence in the outer part of the earth's central core and is moving rapidly (by fluid moving in central core). Hydrodynamic theory used in meteorology and oceanography helps solve t problem by analogy, and can explain westward drift and secular variations in motion of the ear its poles, axis of rotation, etc. *Subject Heading:* **1. Geomagnetic theories.**—*M.R.*

9J–27 550.380

Fanselau, Gerhard, **Gedanken über die technische Durchführung des geomagnetischen R gistrierbetriebes.** [Ideas on the technical management of geomagnetic registration.] *Zeitsch für Meteorologie*, 5(12):364–373, Dec. **1951.** 7 figs., 2 tables, 2 refs., 12 eqs. **DWB**—After a criti discussion of the usual method of recording geomagnetic variations, author shows that a close spac of the instruments is possible without mutual interference. A travelling recording station, c structed at Niemegk on these lines to obtain field measurements in the shortest possible lines, described and illustrated. *Subject Heading:* **1. Geomagnetic registration.**—*C.E.P.B.*

TECHNIQUES AND EQUIPMENT

9J–28 550.380.14:629

Hurwitz, L., **Reduction of airborne magnetometer results.** *American Geophysical Uni Transactions*, 34(3):360–362, June **1953.** 3 refs., 17 eqs. **DLC, DWB**—Reduction of observatio obtained with the vector airborne magnetometer, Model 1A, is somewhat simplified by the co putation of reduced (level-flight) angles. Aircraft swing data are analyzed by magnetic field co

nents X, Y, Z rather than by elements D, H, Z. Similarly corrections for aircraft magnetism are pplied to components, thus facilitating the application of punch-card processing methods. *Subject eading:* **1. Geomagnetic surveys by aircraft.**—*Author's abstract.*

9J–29 550.380.14

†Lundbak, Asger (*Copenhagen*), **Calculation of magnetic declination and horizontal intensity n the basis of the vertical intensity.** *Geofisica Pura e Applicata*, 20:31–45, July–Dec. **1951.** 4 figs., refs., 7 eqs. **DLC**—If the magnetic vertical intensity Z is known over a certain area, it is possible nder more precisely defined conditions which are often complied with at arbitrary points of the me area—though with the exception of the marginal area—to calculate the deviations of the orizontal intensity H and the magnetic declination D, from constant values. Some details of the lculation in practice are given, i.e., by means of an example, the mathematical basis for the cal- ulations being outlined in the introduction. A graticule, as seen in a figure, was used in the cal- ulations and the method itself is described. In other diagrams, figures at the crosses denote values H and D computed in this way—indicated in gammas and arc-minutes, respectively. The ccuracy of and the possibilities for application of the method are discussed. *Subject Heading:* **Magnetic declination.**—*Author's abstract.*

9J–30 550.380.14

Serson, P. H. and Hannaford, W. L. W. (*both, Dominion Obs., Dept. of Mines & Tech. Survey, ttawa, Canada*), **A statistical analysis of magnetic profiles.** *Journal of Geophysical Research*, ash., D. C., 62(1):1–18, March **1957.** 9 figs., 8 refs., 16 eqs. **DLC**—Autocorrelation functions e computed for profiles of D, H, and Z obtained by a three-component airborne magnetometer ver Western Canada and over the Atlantic east of Bermuda. The accuracy of magnetic charts computed as a function of the distance over which interpolation is made. The accuracy is not gnificantly increased by smoothing. A comparison with the autocorrelation functions of simple odels indicates that most anomalies originate in a thin layer 11 km below sea level under the con- nent and 6.5 km below sea level under the ocean. Intense magnetization of the rocks (0.005 to 05 cgs) is indicated. *Subject Headings:* **1. Magnetic profiles 2. Autocorrelations 3. Magnetic nomalies 4. Western Canada 5. Atlantic Ocean.**—*Authors' abstract.*

9J–31 550.380

Waters, G. S., **A measurement of the earth's magnetic field by nuclear induction.** *Nature*, ondon, 178(4484):691, Oct. 8, **1955.** 2 refs. **DWB**—A simple method used at Christchurch, ants, is briefly described. The protons in a sample of water are polarized magnetically at right ngles to the earth's field. When the polarizing field is switched off, the residual magnetic vector recessing about the earth's field induces a signal voltage in a pick-up coil. The frequency of recession gives the value of the earth's magnetic field. *Subject Heading:* **1. Magnetic field measure- ent.**—*C.E.P.B.*

9J–32 550.380

Zmuda, Alfred and McClung, Lowell, **Vertical extrapolation of geomagnetic field components.** *merican Geophysical Union, Transactions*, 36(6):939–942, Dec. **1955.** 26 eqs. **DWB, DLC**—In he region external to sources of magnetism, both the divergence and the curl of the magnetic in- ensity are zero. From the corresponding analytic expressions, the derivatives in the vertical irection of each field component are obtained in terms of the values of the components on a surface urrounding the sources. A Taylor series is formed with these derivatives and then used to continue, ither upward or downward, the respective components. The rapidity of the convergence depends n the complexity of the surface field and on the distance of the computed point from the surface. *ubject Heading:* **1. Geomagnetic field computations.**—*Authors' abstract.*

9J–33 550.380.87

Alldredge, L. R., **Keeping track of the earth's magnetic field.** *Physics Today*, 5(11):8–12, Nov. **1952.** 5 figs. **DLC**—Author gives an introductory review of the subject, its characteristics f field and the instrumental investigation. He describes the novel "universal airborne magne- ometer," built in such a way that the orientation angles of the detector coil can be recorded auto- natically, which enables the determination of the entire field vector, amplitude and direction for omputation. The instrument is now being test flown in a Navy P2V. Comparison between arious methods of survey shows that one aircraft provides data which 10 to 15 ships combined ould gather. *Subject Heading:* **1. Air-borne magnetometers.**—*W.N.*

9J–34 550.380.87:523.74

Beggs, D. W. and Von Klüber, H., **A solar magnetograph.** *Nature*, London, 178(4547):1412, ec. 22, **1956.** 7 refs. **DWB**—A photoelectric magnetometer (modification of Babcock's) is

described. This has "revealed a wealth of magnetic structure on the sun's surface," includi magnetic fields which are precursors of sunspots, and very small areas of relatively strong magnetis *Subject Headings:* **1. Solar magnetographs 2. Solar magnetism.**—*C.E.P.B.*

9J–35 550.380.

Dürschner, Horst, **Enregistrement à distance des variations du champ magnétique terrestr** [Telemetric recording of variations in the terrestrial magnetic field.] *Annales de Géophysiqu* Paris, 7(4):199–207, **1951.** 9 figs. **DLC**—A direct recording magnetometer with adjustab sensitivity developed for measuring intensities of the horizontal component of the terrestrial magnet field, but applicable (with simple modifications) to any component, is described and illustrate A magnetic needle is exposed to the terrestrial magnetic field and to a compensatory magnet field created by two Helmholz coils; a mirror fixed on the needle projects a narrow beam of light two photoelectric cells, thus creating an electric current. Variations in this current are recorde The author presents equations accounting for the connection between the terrestrial magnetic fiel the compensatory magnetic field and the torsion coefficient of the suspension of the needle. T magnetometer, electronic apparatus and recorder are described in detail. Sample recordings a presented and compared with results obtained simultaneously by a conventional apparatus, wi which they are found to agree. A similar apparatus was developed at Kakioka Observator *Subject Headings:* **1. Magnetometers 2. Recording instruments 3. Magnetic field variation** —*G.T.*

9J–36 550.380.8:538.082

Fanselau, Gerhard, **Weitere Versuche mit der magnetischen Fadenwaage.** [Further i vestigations with the magnetic thread-balance.] *Zeitschrift für Meteorologie,* 5(7/8):239–245, July Aug. **1951.** fig., 3 tables, eqs. **DWB**—A new geomagnetic instrument was tested in the field. simple temperature correction was applied. Both H and V can be measured; calibration is d scribed. *Subject Heading:* **1. Geomagnetic instruments.**—*C.E.P.B.*

9J–37 550.380.8

Ishikawa, G., **On the astatic-magnet variometer.** *Meteorological Society of Japan, Journa 2nd Ser.,* 28(11):407–418, Nov. **1950.** 7 figs., 5 eqs. In Japanese; English summary p. 418. **DW** —Discusses mechanical properties of astatic-magnet variometer for observations of small magnet variations and methods of measuring sensitivity. *Subject Headings:* **1. Astatic-magnet variometer 2. Geomagnetic instruments.**—*C.E.P.B.*

9J–38 550.380.8

Özdogan, Ihsan, **Variomètre électromagnétique pour la composante verticale.** [Electro magnetic variometers for the vertical component.] *Annales de Géophysique,* 9(2):161–163, 195 6 figs., 5 refs. **DLC**—Instrument for measurement of rapid variations in the vertical compone of the geomagnetic field is described and records illustrated. The principle is the same as for electro magnetic seismographs. The record is photographic. *Subject Headings:* **1. Electromagneti variometers 2. Geomagnetic instruments.**—*M.R.*

9J–39 550.380.8

Przybyszewski, Eugeniusz (*Inst. of Geophysics, Polish Acad. of Sciences*), **Comparison of l Cour magnetometers at the Geophysical Observatory on the Hel Peninsula.** *Acta Geophysic Polonica,* Warsaw, 5(1):22–33, **1957.** 19 tables. **DWB, DLC**—In this paper the author compare the la Cour magnetometers of the Hel Geophysical Observatory with one another and with respec to the base line of the magnetographs at Świder Geophysical Observatory. The correction $\Delta H's$ found for the base line of the H magnetograph in Świder, with respect to the mean of all three QHM magnetometers, is $+0.17y$, while the correction $\Delta Z's_w$ for the base-line of the Z magnetograph i Świder, with respect to the BMZ-87 magnetometer, is $-28.15y$. Taking into account the correction found, the author lists in tables 13 and 19 the differences for the H and Z components between th observatories at Świder and on Hel for the epoch 1954.8. *Subject Headings:* **1. Magnetometer comparisons 2. la Cour magnetometer.**—*Author's abstract.*

9J–40 550.380.8

Schonstedt, E. O. and Irons, H. R., **Airborne magnetometer for determining all magneti components.** *American Geophysical Union, Transactions,* 34(3):363–378, June **1953.** 16 figs. 7 refs., 10 eqs. **DLC**—The NOL vector airborne magnetometer Type 1A (VAM-1A), designed fo measuring components of the geomagnetic field from aircraft, consists of a modification of th AN/ASQ-3A equipment employed for geophysical exploration by air. The VAM-1A continuously records the total intensity of the field and its direction, with respect to vertical and horizontal coordinates established by pendulum. The effects of accelerations of the aircraft on the vertica

ccuracy of the pendular reference are largely eliminated by averaging the magnetometer data over period normally required for two phugoid oscillations of the aircraft. The operation of the magnetometer is limited to regions in which the magnetic dip exceeds 45°. The magnetometer is estimated measure F, H, and Z to an accuracy of 200 gammas. *Subject Headings:* **1. Air-borne magnetometers 2. Geomagnetic field measurement.**—*Authors' abstract.*

9J–41 550.380.87:550.385

Thiesen, K. (*Danish Met. Inst., Copenhagen*), **About the influence of magnetic disturbances on geomagnetic variometers.** *Geophysica*, Helsinki, 5(4):177–192, **1958.** 2 figs., tables, 4 refs., eqs. **DWB, DLC**—Equations for the movements of a magnetic needle by two sorts of magnetic disturbances are set up: 1) where the variable magnetic force is a regular harmonic pulsation, 2) where it is a force given by $F = F_0 \cdot t$, where F_0 is a constant and t the time. For different variometers of the type of la Cour, the constants of the equations are computed and also the ratio BC between the sensibilities by disturbances, and in case of a quiet field. By the oscillations it is seen that when the damping of the needle is varying, the ratio BC between the sensibilities has its most favorable value when the logarithmic decrement $\delta = 3.63$. By the field $F = F_0 t$, the sensibility is the same as at a quiet field. In several quick-run records on days with disturbances, small oscillations are shown with the same period as the variometers used. These oscillations are caused by the first term in the formula for the movement of the needle

$$Ae^{-(F/2D)t}\sin\left(\frac{2\pi t}{T_e} - \varphi_e\right) + \frac{MF_0}{C}\left(t - \frac{F}{C}\right)$$

where T_e is the period of the needle. They are therefore not belonging to the earthfield when only the last term gives the variation of the earthfield. *Subject Headings:* **1. Magnetic influences on variometers 2. Variometers.**—*Author's abstract.*

9J–42 550.380.84:629.123

Werner, Karl, **Magnetkompass mit Feldstärkeanzeige zur peilungsfreien Kompensierung und Deviationskontrolle.** [Magnetic compass with field strength indicator for adjustment and control of deviation without optical bearings.] *Deutsche Hydrographische Zeitschrift*, 8(2):59–65, **1955.** 4 figs., 2 refs., 16 eqs. English and French summaries p. 59. **DWB**—Describes the principles of compass systems which enable the deviation to be computed from measurements of the magnetic field intensity. Suitable modifications to the double compass are described. *Subject Headings:* **1. Magnetic field measurement 2. Compass correction.**—*C.E.P.B.*

SURFACE FEATURES OF STEADY FIELD

9J–43 550.382.3:551

Bruckshaw, J. M., **Rock magnetism—some recent developments.** *Science Progress*, London, 42(167):406–418, July **1954.** 3 figs., 18 refs. **DLC**—Magnetic characters of rocks of age up to 200 million yrs show alternations of normal and reversed dip. Results for igneous and sedimentary rocks differ, but there is some consistency indicating a reversal of the earth's main magnetic field. *Subject Heading:* **1. Magnetism of rocks.**—*C.E.P.B.*

9J–44 550.382.7

Castet, Jean and Lagrula, Jean, **Sur la comparaison d'anomales gravimétriques et magnétiques au Sahara.** [Comparison of gravimetric and magnetic anomalies in the Sahara.] *Académie des Sciences, Paris, Comptes Rendus*, 241(1):84–86, July 4, **1955.** fig., 2 refs. **DWB**—Two series of results g and Z, obtained during a common mission in 1953 on various itineraries in the Sahara, are compared. It has been shown that the correlation between gravimetric and magnetic anomalies is evident in certain regions, and rather weak in others. This is exemplified by a diagram showing the gravimetric and magnetic profiles on the stretch Médéa-Tamanrasset along the Imperial track $\varepsilon° = 1$. *Subject Headings:* **1. Gravimetric anomalies 2. Magnetic anomalies 3. Sahara.**—*A.M.P.*

9J–45 550.384:551.78

Cox, Allan, **Remanent magnetization of Lower to Middle Eocene basalt flows from Oregon.** *Nature*, London, 179(4561):685–686, March 30, **1957.** 4 figs., 5 refs. **DWB**—Mean position of pole given by 57 samples from 8 flows is 37°N 50°W. This is about 30°N.E. of average pole from Deccan traps which are probably slightly older. *Subject Heading:* **1. Paleomagnetism.**—*C.E.P.B.*

9J–46 550.38:525.3

Doell, Richard R., **Palaeomagnetic study of rocks from the Grand Canyon of the Colorado River.** *Nature*, London, 176(4494):1167, Dec. 17, **1955.** table, 5 refs. **DWB**—Deduces a position

for the pole of 115°E, 39°N in Supai (Permian) and 144°W, 18°N in Hakatai (Algonkian). Agre ment with figures obtained by S. K. RUNCORN is "encouraging." *Subject Headings:* **1. Paleomagn tism 2. Polar drift.**—*C.E.P.B.*

9J–47 550.382.3 :550.3

Graham, John W., **Note on the significance of inverse magnetizations of rocks.** *Journal Geophysical Research*, 57(3):429–431, Sept. **1952.** 10 refs. **DWB**—Since many rocks acquire reversed magnetic field when cooling from a molten state, and since many rocks have a rever field from the earth's present one, it is suggested that the earth's field may not be so constant we once thought—in other words it may have reversed itself at some time in its history. *Subj Headings:* **1. Terrestrial magnetism 2. Origin of earth 3. Inverse magnetization.**—*M.R.*

9J–48 550.382

Graham, John W. (*Dept. of Terrestrial Magnetism, Carnegie Inst. of Wash., Wash., D. C.*), **Roc magnetism and the earth's magnetic field during Paleozoic time.** *Journal of Geophysical Researc* 59(2):215–222, June **1954.** figs. **DLC**—A brief appraisal is given of the observations and argumen that are advanced in support of the opinion that during Paleozoic time the earth's magnetic fie retained approximately its present orientation, and except for possible brief excursions, its presen sense. *Subject Headings:* **1. Earth's magnetic field 2. Magnetism of rocks.**—*Author's abstract.*

9J–49 550.382.3 :550.3

Kawai, Naoto and Kume, Shōichi (*both, Faculty of Science, Kyoto Univ.*), **The thermal fluctuatio after-effect found in the natural remanent magnetic polarization of rocks.** *Journal of Geomagnetism and Geoelectricity*, Kyoto, 5(3):66–70, Nov. **1953.** 7 figs., 9 refs. **DLC**—In the study of natura remanent magnetic polarization of rocks, the authors found many kinds of sedimentary rocks whos major part of the polarity may probably be attributed to thermal fluctuation after-effect, resultin from the influence of the geomagnetic field during the geological interval. This paper reports th polarity of tertiary rocks observed and experiments of the related problems carried out in our lab oratory. *Subject Headings:* **1. Paleomagnetism 2. Geothermal effects.**—*Authors' abstract.*

9J–50 550.382.

Korneva, L. A., **Anomal'noe geomagnitnoe pole i ekvivalentnaia emu sistema tokov mirovog okeana.** [Anomalous geomagnetic field and the equivalent system of currents in the world ocean. *Akademiia Nauk SSSR, Doklady*, 76(1):49–52, **1951.** 2 figs., 5 refs. **DLC**—Trans. into English by E. R. Hope, issued as *Canada. Defence Research Board*, [*Translation*], T-247-R, June **1957**, p. 6–9. figs., refs. **DWB**—To test the theory advanced by V. V. SHULEĬKIN (*see* 9J–62) that th anomalies of the geomagnetic field are linked with electric currents in the ocean, the author set up a fairly elaborate laboratory model of the earth (43 cm in diameter) using sheet copper for the ocean and considering the continents to be non-conducting. A small powerful solenoid was mounted centrally on the axis of the globe. Some of the anomalous features of the geomagnetic field were reproduced, as shown on charts. However, more and deeper measurements in the oceans (electric current density) must be made. *Subject Headings:* **1. Geomagnetic-field anomalies 2. Electric currents in ocean 3. Translations. I. Shuleĭkin, V. V.**—*M.R.*

9J–51 550.382.7

Korneva, L. A., **O vostochnoĭ sostavliaiushcheĭ magnitnogo polia zemli.** [Concerning the eastward component of the terrestial magnetic field.] *Akademiia Nauk SSSR, Doklady*, 80(6):879–880, **1951.** fig., 3 refs. **DLC.** Trans. into English by E. R. Hope, issued as *Canada. Defence Research Board*, [*Translation*], T-247-R, June **1957.** p. 10–11. fig., refs. **DWB**—A chart of the eastward component of the geomagnetic field for the 1945 epoch is constructed, showing the effect of the distribution of continents and oceans, as revealed by the contours following the coastlines of the major continents, and by great centers of disturbance in the Atlantic, Indian and Pacific Oceans. *Subject Headings:* **1. Eastward component of geomagnetic field 2. Geomagnetic field anomalies 3. Translations. I. Shuleĭkin, V. V.**—*M.R.*

9J–52 550.382.7

Korneva, L. A., **O nesimmetrichnoĭ otnositel'no zemnoĭ osi chasti geomagnitnogo polia v raĭonakh Arktiki i mirovogo okeana.** [The part of the geomagnetic field non-symmetrical to the earth's axis in the Arctic and oceanic regions.] *Akademiia Nauk SSSR, Doklady*, 107(5):679–682, **1956.** 2 figs., 6 refs. **DLC.** Trans. into English by E. R. Hope, issued as *Canada. Defence Research Board*, [*Translation*], T-247-R, June **1957.** p. 12–15. figs., refs. **DWB**—Further evidence for the SHULEĬKIN theory that the anomalous geomagnetic field is caused by current flowing in the ocean (completing the convective electric circuit caused by solar-cosmic rays in the stratosphere) is presented from data on geomagnetic fields in the Arctic Ocean (at the N. Pole) and in the other Oceans.

arts show current equivalents of the anomalous geomagnetic field in the Arctic and Atlantic, cific and Indian Oceans. Still more oceanic electric current data must be had to verify or dis- ove this theory. *Subject Headings:* **1. Geomagnetic-field anomalies 2. Electric currents in ean 3. Translations 4. Arctic Ocean. I. Shuleĭkin, V. V.**—*M.R.*

9J–53 550.382.3:551.1

Manley, H., **Rock magnetism as a temperature indicator.** *Journal of Geomagnetism and oelectricity*, Kyoto, 6(1):47–51, March **1954.** fig., 2 tables, 6 refs. **DLC**—The magnetic prop- ies of a series of Scotch dykes are given briefly and the results afford a good correlation with their gree of metamorphism. The intensity of remanent magnetization falls rapidly with increase of tamorphism. The unaltered dyke material described here is believed to be a case of remanent ignetism in the oldest rocks yet mentioned in literature. *Subject Heading:* **1. Magnetism of rocks.** *Author's abstract.*

9J–54 550.38:525.3

Martinez, Joseph D. and Howell, Lynn G., **Palaeomagnetism of chemical sediments.** *Nature*, ndon, 178(204–205), July 28, **1956.** fig., 2 refs. **DWB**—Large calcareous concretions and shale mples of Mississippian age in Texas gave the average position of the S. magnetic pole in 39°N 4°E, but 8 measurements indicate the N. magnetic pole in 42°N 142°E. *Subject Headings:* **Paleomagnetism 2. Polar displacement.**—*C.E.P.B.*

9J–55 550.382.3

Nagata, Takesi; Uyeda, Seiya and Akimoto, Syun-iti (*all, Geoph. Inst., Tokyo Univ.*), **Self- versal of thermo-remanent magnetism of igneous rocks.** *Journal of Geomagnetism and Geo- ctricity*, Kyoto, 4(1):22–38, April **1952.** 21 figs., 2 tables, 13 refs., 21 eqs. **DLC**—An experimental oof of self-reversal of thermo-remanent magnetization of igneous rocks is obtained. By cooling a weak magnetic field, some igneous rocks and the ferromagnetic minerals separated from the other rocks can have the remanent magnetization whose direction is opposite to that of the mag- tic field during cooling. The processes of development and decay of the reverse thermo-remanent agnetization by cooling and heating, respectively, were directly observed and the characteristics its appearance were examined. A few possible mechanisms of appearance of this peculiar phe- omenon are discussed with reference to NÉEL's theory. *Subject Heading:* **1. Magnetism of rocks.**— *uthors' abstract.*

9J–56 550.382.3:551.762:551.1

Nairn, A. E. M., **Relevance of palaeomagnetic studies of Jurassic rocks to continental drift.** *ature*, London, 178(4539):935–936, Oct. 27, **1956.** table, 4 refs. **DWB**—Paleomagnetic data for rassic rocks in Yorkshire, Arizona, Rhodesia and Tasmania, are tabulated. They show that ritain and North America were in approximately the same position relatively to the pole as now, t the Rhodesian data place the N pole in 61°N, 76°W and the Tasmanian in 50°N, 23°W. This dicates a drift of Rhodesia by 2000 mi and of Tasmania by 2800 mi. *Subject Headings:* **1. Paleo- agnetism 2. Continental drift.**—*C.E.P.B.*

9J–57 550.382

Ostrekin, M. E., **O magnitnoĭ anomalii v tsentral'noĭ Arktike.** [Magnetic deviation in the ntral Arctic.] *Priroda*, Moscow, No. 7:127–128, July **1956.** figs., ref. **DWB, DLC**—In answer questions posed by readers of this journal, asking if there exists a second magnetic pole in the ctic (as supposed by B. P. VAINBERG in 1940), and what causes the magnetic deviation in the ctic, the author, a well-known Arctic explorer, asserts that (on the ground of magnetic observations rried out since 1948 by high latitude aerial expeditions, and studies made at drifting ice stations) was possible to draw reliable magnetic maps of the whole Arctic region. It has been established at there is no "second magnetic pole" in the Arctic. But a peculiar magnetic deviation, stretching a narrow strip from Taimyr Peninsula across the whole Arctic basin to the sole magnetic pole in e Canadian Archipelago (13°N, 100°W), does exist. An analysis shows that the peculiarity of the omagnetic elements distribution in the Arctic basin can be explained by the presence of an Asiatic aximum of the geomagnetic-field intensity. It should be assumed that this Asiatic maximum not caused by deposits of magnetized rocks in the upper layer of the earth's crust, but is connected th physical processes taking place at a depth of 2–3 thousand km, or with the physical form of ternal parts of the earth's globe. This is what apparently changes the elements of the magnetic ld to a distance of several thousand km. However, the problem of the causes of the deviation s not yet been fully solved, and requires further extended investigations. Two schematic maps, e of the horizontal component, the other of the magnetic inclination in the Arctic, are added. *bject Headings:* **1. Second magnetic pole 2. Magnetic deviation 3. Arctic.**—*A.M.P.*

9J–58 550.38

Press, Frank and Ewing, Maurice, **Magnetic anomalies over oceanic structure.** *Ameri… Geophysical Union, Transactions*, 33(3):349–355, June **1952.** 7 figs., 8 refs., 11 eqs. **DWB**—T… importance of the airborne magnetometer as a geophysical tool in the study of oceanic structure… stressed. Theoretical anomalies of the total magnetic vector are computed for typical ocea… structures to aid in the planning of aerial surveys. These structures are (1) a volcanic isla… (2) a crustal fold associated with a negative gravity strip, and (3) a continental border. *Subj… Headings:* **1. Magnetic anomalies 2. Oceanic structures.**—*Authors' abstract.*

9J–59 050.382.3:5

Roquet, J., **Sur les rémanences magnétiques des oxydes de fer et leur intérêt en géomagnétisn… Deuxième partie.** [Residual magnetism of ferrous oxides and its importance in geomagnetis… Pt. 2.] *Annales de Géophysique*, Paris, 10(4):282–325, Oct./Dec. **1954.** 35 figs., 7 tables, e… French and English summaries p. 282. **DLC**—The stability of thermo-remanent and isotherm… magnetizations of ferro-oxides and natural substances under the influence of (1) opposed fiell… (2) the effect of heatings and (3) the effect of time is treated in this paper. A number of properti… of remanent magnetization, acquired by a natural powdered magnetite, depending on the size of t… grains, were determined and are reported in great detail, together with numerous graphs. *Subj… Headings:* **1. Magnetization of ferrous oxides 2. Geomagnetism.**—*From author's abstract.*

9J–60 550.38:550.382.3:52…

Runcorn, S. K., **Palaeomagnetism of sediments from the Colorado Plateau.** *Nature*, Londo… 176(4480):505–506, Sept. 10, **1955.** table, 4 refs. Also: Du Bois, P. M., **Palaeomagnetic measur… ments of the Keweenawan.** *Ibid.*, p. 506–507. fig., 2 refs. **DWB.** Also: Runcorn, S. K., **T… permanent magnetization of rocks.** *Endeavour*, London, 14(55):152–157, July **1955.** 4 fig… table, 16 refs. **DLC**—In the first paper, the position of N. Pole from late Precambrian to Tertiar… deduced from remanent magnetism in Grand Canyon rocks, is compared with British data. Bo… indicate irregular motion from central Pacific towards present position, and discount movement… America relative to Europe. Also, from Precambrian rocks near Lake Superior, the position of t… pole is calculated as 20°N 165°E, moving westwards. In the second paper (by RUNCORN, *Endeavou…* there is strong evidence that the direction of magnetization of rocks perpetuates that of the earth… field at the time of their formation. On this assumption it is possible, by examining rocks of know… age, to discover the variations which have taken place in the direction of the earth's field. Of ou… standing interest is the considerable body of evidence that the geomagnetic field has in the past unde… gone repeated reversals. *Subject Headings:* **1. Palaeomagnetism 2. Polar displacement 3. Ge… magnetism 4. Magnetism of rocks.**—*C.E.P.B. and author's abstract.*

9J–61 550.382…

Shuleĭkin, V. V., **Magnitnoe pole zemli i mirovoĭ okean.** [Terrestrial magnetic field and t… world ocean.] *Akademiia Nauk SSSR, Doklady*, 76(1):57–60, **1951.** fig., 5 refs. **DLC.** Tran… into English by E. R. Hope. Issued as *Canada. Defence Research Board*, [*Translation*], T-247-… June **1957**, p. 1–5. fig., refs. **DWB**—An attempt is made to explain the known characteristics… the geomagnetic field—especially the parallelism between the lines of the continents and oceans—… on the basis of electric currents in the sea, or convective currents producing enhanced electric curren… or fields in the stratosphere above the oceans and continents, or horizontal convective curren… connected with the general circulation which is influenced by continental-oceanic configuratio… Although the suggested models are qualitative, a few figures are given by way of establishing orde… of magnitude involved in geomagnetic field. *Subject Headings:* **1. Geomagnetic-field anomalie… 2. Cosmic ray effects 3. Translations.**—*M.R.*

9J–62 551.501.7:550.382…

Sutton, D. J. and Mumme, W. G. (*both, Dept. of Physics, Univ. of Adelaide*), **The effect o… remanent magnetization on aeromagnetic interpretation.** *Australian Journal of Physics*, Melbourne… 10(4):547–557, Dec. **1957.** 6 figs., 5 refs., 10 eqs. **DLC**—The interpretation of aeromagnetic map… when the source may be approximated to a point dipole or line of dipoles is considered for the genera… case in which the dipole moment is not necessarily parallel to the earth's magnetic field. For th… line of dipoles, it is shown that even in this general case the depth and location of the source can b… found, and in addition the direction of the component of the dipole moment in a plane normal to th… line source may be determined. If the Königsberger ratio for the rock constituting the source i… large, this is approximately the direction of the remanent magnetization. Such information i… important from a palaeomagnetic viewpoint. When the source approximates closely to a point… dipole, it is not possible both to locate the source and determine the direction of the dipole momen… from an analysis of the aeromagnetic map and the solution of the problem requires further informa… tion. *Subject Headings:* **1. Aeromagnetic mapping 2. Remanent magnetization.**—*Authors' abstract*

GEOMAGNETIC POLES

9J–63 550.383.7

*Bullard, E. C. (*Nat. Phy. Lab., Teddington, England*), **Is the earth's dipole moment increasing?** *urnal of Geophysical Research*, 58(2):277–278, June **1953.** 2 tables, refs. **DWB**—The earth's ıgnetic moment (both vertical and horizontal) decreased from 1829 to about 1934, but data ob- ned from 24 stations all over the world indicate that a slight reversal of this tendency has occurred the past 20 yrs. Table shows data for 1930, 1935, 1940, 1945 and 1950 for all stations and for ɔse in the Northern and Southern Hemisphere separately. These data show a slight decrease in Hemisphere and a marked increase at S. Hemisphere stations. VESTINE's (1947) data show a crease up to 1945 but a lesser decrease between 1940 and 1945 than hitherto. *Subject Headings:* **Geomagnetic field intensities 2. Earth's dipole moment.**—*M.R.*

9J–64 550.383

Bullard, E. C.; Freedman, Cynthia; Gellman, H. and Nixon, Jo., **The westward drift of the .rth's magnetic field.** *Royal Society of London, Philosophical Transactions, Ser. A*, 243(859):67–92, ːt. 27, **1950.** 11 figs., 13 tables. **DWB**—During 1907–1945, the nondipole part (i.e., minor ıtures) of the earth's magnetic field drifted westward by $0.18 \pm .015°$/year and the secular variation $0.32 \pm .067°$/year. The changes are shown in a series of world maps and tables for 1907 and 1945. ıe drift is explained by the dynamo theory of the earth's field, in which the outer part of the earth's re travels westward relative to the solid mantle, carrying the minor features of the field with it. *ubject Heading:* **1. Earth's magnetic field 2. Magnetic field drift.**—*C.E.P.B.*

9J–65 550.383

Chargoy, Anselmo, **El cuadripolo magnético terrestre.** [The earth's magnetic quadripole.] *ournal of Geophysical Research*, 55(1):47–49, March, **1950.** 5 refs., 5 eqs. English summary 47. **DWB**—The plane containing the earth's quadripole, as defined by STRATTON, coincides ith the geomagnetic equator. Its intersections with geographical equator and with surface of the ırth are calculated. *Subject Heading:* **1. Terrestrial magnetism.**—*C.E.P.B.*

9J–66 550.383

Darwin, Sir Charles, **Electron inertia and terrestrial magnetism.** *Royal Society of London, roceedings, Ser. A*, 222(1151):471–476, March 23, **1954.** 3 refs., 29 eqs. **DWB**—Owing to re- rdation of earth's rotation by tidal friction, electron inertia gives a geomagnetic field, but this nnot exceed 1.5×10^{-17} gauss. This is in the right direction but negligibly small to explain earth's agnetic field. *Subject Headings:* **1. Earth's magnetic field 2. Rotation of the earth.**—*C.E.P.B.*

9J–67 550.383:525.3

Elsasser, W. M. and Takeuchi, H., **Non-uniform rotation of the earth and geomagnetic drift.** *merican Geophysical Union, Transactions*, 36(4):584–590, Aug. **1955.** 2 figs., num. refs., num. eqs. WB—The transmission of mechanical forces of the magnetic field through the top layers of the core ıd into the mantle is analyzed. It is shown that moderate fluctuations of the toroidal field near the ɔundary of the core are adequate to produce the observed variations in the earth's rate of rotation. simple model of the boundary layer of the core is worked out and it is shown that the angular elocity, on going down from the boundary of the core, must first decrease and then increase again, agreement with the observations on the westward drift and with the dynamic theory. (*Same ɛm as* 6.7–30, July 1955, *MAB.*) *Subject Headings:* **1. Geomagnetic drift 2. Rotation of the earth.** *-Authors' abstract.*

9J–68 550.383:525.3

Holm, Gustave R. (4849 *West Belden Ave., Chicago, Ill.*), **Gravitation and gyromagnetism.** *ɔurnal of Geophysical Research*, 57(4):527–530, Dec. **1952.** 3 refs. **DWB**—This article seeks develop a picture of the physical processes in space which are responsible for the existence of field ıenomena, deriving certain relations between these phenomena outside the scope of the usual ıld theories. Field phenomena represent processes on such a fine scale that details are, in general, ıobservable (except insofar as the quantum aspect is concerned). We can, therefore, only classify ıd determine net energy differences, which is all that is needed to account for field phenomena at the dinary scale of magnitude. We have discussed the derivation and interpretation of the electro- agnetic field equations in published articles (*American Journal of Physics*, 18(509), Nov. **1950;** so, *Journal of the Western Society of Engineers*, 53(87), June **1948**). The present article extends e same basic structure to include gravitation, and indicates a simple relationship between gravita- ɔn and electromagnetism. *Subject Headings:* **1. Rotation of the earth 2. Terrestrial magnetism.** *Author's abstract.*

9J–69 550.

Jacobs, J. A., **Effect of altitude on the position of the magnetic pole.** *Nature*, London, 178(452 35–36, July 7, **1956.** table, ref. **DWB**—From 48 spherical harmonic coefficients of the magn potential in 1942 evaluated by H. SPENCER JONES and P. J. MELOTTE, the position of the magn pole was calculated at ground level, 100 and 250 km. There was no change of longitude with heig but between ground and 250 km the position moved northward by 1° lat. *Subject Heading:* **1. G magnetic pole.**—*C.E.P.B.*

9J–70 550.383:52

Munk, Walter and Revelle, Roger, **On the geophysical interpretation of irregularities in rotation of the earth.** *Royal Astronomical Society, Monthly Notices, Geophysical Supplement*, 6(6):33 347, Sept. **1952.** fig., eqs., tables, foot-refs. **DWB**—Astronomical observations have indica that variations in the earth's rotation by several parts per hundred million sometimes occur o periods of one or two decades. These irregularities may be caused by variations in the distributi of matter, or by variable motion relative to the earth. It is found that processes in the atmosph and ocean are inadequate to account for all of the observed irregularities, but that their effect is n necessarily negligible. Processes in the crust and mantle could barely do so, but such processes se highly unlikely for a number of reasons. The irregularities can be accounted for by a varia motion in the core amounting to a fraction of the total motion indicated by the westward drift the earth's magnetic field. *Subject Headings:* **1. Rotation of the earth 2. Magnetic field drift.** *Authors' abstract.*

9J–71 550.38

Saxov, Svend., **Lidt om den magnetiske sydpol.** [Contribution on the magnetic south pol *Geografisk Tidsskrift*, Copenhagen, 54:1–7, **1955.** fig., table, 17 refs. **DWB**—This is an objecti review of the studies made from 1825–1953. The different positions of the magnetic south pole determined by the individual scientist and/or expedition are tabulated respectively in chronologic order. Recent measurements were made with the aid of the Q.H.M. magnetometer, the gre accuracy of which has been established. *Subject Headings:* **1. Magnetic poles 2. Magnetometer** —*W.N.*

9J–72 550.383:525

Vestine, E. H. (*Dept. of Terrestrial Magnetism, Carnegie Inst., Wash., D. C.*), **On variations the geomagnetic field, fluid motions, and the rate of the earth's rotation.** *Journal of Geophysica Research*, 58(2):127–145, June **1953.** 6 figs., 2 tables, 15 refs., 8 eqs. **DWB**—Estimated tim fluctuations in the rate of westward drift of the geomagnetic field, 1885–1945, are shown to co respond reasonably well with the unexplained systematic fluctuations in the earth's rate of rotatio by BROUWER. In view of other geophysical evidence on the rigidity of the earth, it appears reaso able to conclude (1) that the source of the geomagnetic field lies within a large-scale fluid circulatio inside the central core of the earth; and (2) that this fluid circulation in the core must be considere established as real, since no other adequate large source needed to conserve angular momentum apparently available. As an independent check, a smaller time-fluctuation derived from the nort erly drift of the geomagnetic field may afford, through the associated fluid motion, an explanatio of the non-seasonal departures observed in the variation of latitude, yielding an estimated angul momentum transverse to the axis of rotation. *Subject Headings:* **1. Magnetic field drift 2. Rotatio of the earth.**—*Author's abstract.*

9J–73 550.383:525

Vestine, E. H. (*Dept. of Terr. Magnetism, Carnegie Inst. of Wash., D. C.*), **Relation betwee fluctuations in the earth's rotation, the variation of latitude, and geomagnetism.** *Annales d Géophysique*, Paris, 11(1):103, Jan./March **1955.** 3 refs. **DLC**—The experimental geomagneti survey data of the past 60 yrs show that certain simple features of the geomagnetic field mov westward at nonuniform rates. The changes in westward motion appear to be antiparallel to thos deduced for the earth's rate of rotation, as measured from astronomical sights on stars. This ca be explained in terms of fluid motions of the core which carry the source of the magnetic field west ward. As an independent check, other component motions associated with the magnetic fiel about an axis, transverse to the axis of rotation, can afford an unforced explanation of the variatio of latitude. These conclusions are supported mutually by related studies of the problem, due t W. MUNK and R. REVELLE (*see:* 9J–70, Oct. 1958, *MAB*) and S. K. RUNCORN (*see: Am. Geophys Union Trans.*, Vol. 35:49–63, **1954**). *Subject Headings:* **1. Geomagnetic variations 2. Rotatio of the earth 3. Latitude variations.**—*Author's abstract.*

9J–74 550.383.

Whitham, K. and Loomer, E. I., **The diurnal and annual motions of the north magnetic dip pole.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(6):349–351, June **1956.** fig., 4 refs.

WB—Describes observations of magnetic components at Resolute Bay (74.7°N, 265.1°E). The paths of the dip pole during average quiet and disturbed days and mean monthly positions July 1954–June 1955 are shown. Secular drift of mean position is about 4 mi slightly E of N per year. *Subject Heading:* **1. Magnetic pole movements.**—*C.E.P.B.*

GEOMAGNETIC SECULAR VARIATIONS

9J–75 550.384.5

Beiser, Arthur (*New York Univ.*), **Variations in the geomagnetic dipole in the past 15,000 years.** *Journal of Geophysical Research*, Wash., D. C., 62(2):235–241, June **1957.** 3 figs., 11 refs., 3 eqs. **DLC**—It is shown that the most likely cause of discrepancies between the ages t of archeological specimens determined from radiocarbon measurements and the corresponding actual ages t' is a long-period variation in the magnetic dipole moment M of the earth. The relationship

$$\triangle M/M \approx 2\{\exp\,[-1.24\times10^{-4}(t'-t)]-1\}$$

is obtained. Comparison with the limited data available shows that, between roughly 5,000 and 15,000 yrs ago, any changes in M that persisted for times of the order of several thousand years could not have exceeded about 10% of the mean value of M in that interval. Shorter-period fluctuations could have been greater, particularly if oscillatory variations occurred. The approximate agreement between the current rate of production of radiocarbon and the mean rate necessary to account for the existing radiocarbon inventory extends this conclusion down to the present day, excluding the possibility that any major, long-term changes in the magnitude of the earth's magnetic field took place in the past ~15,000 yrs. *Subject Headings:* **1. Geomagnetic secular variations 2. Polar migration.**—*Author's abstract.*

9J–76 550.384:523.74

Chernosky, Edwin J., **Long-period variations in geomagnetic activity.** *American Geophysical Union, Transactions*, 36(4):591–595, Aug. **1955.** 3 figs., num. refs. **DWB**—The correlation shown by BARTELS between annual means of the sunspot number and of the magnetic u figure is markedly improved when means of two longer periods are used. These are the fundamental solar periodicities —the 11-year sunspot-number and latitude cycle and the 22-year sunspot magnetism cycle. A plot of 11-year running means shows a 22-year variation not too evident in Bartels' annual means, and 22-year running means shows a secular low at about 1900, with generally rising activity since then in both the objective u and the subjective C measures. Differences in u and C are ascribed more to evaluations of different regions of the magnetic time-variation spectrum than to inconsistencies of C. *Subject Headings:* **1. Magnetic secular variations 2. Sunspot effects on magnetic secular variation.**—*Author's abstract.*

9J–77 550.384.3(931)

Cullington, A. L. (*Magnetic Survey, Geoph. Div., Dept. of Sci. and Indus. Res., Christchurch, New Zealand*), **The magnetic secular variation in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B*, 33(5):355–372, March **1952.** 7 figs., 8 tables, 4 refs., 3 eqs. **DLC**—Isomagnetic charts show secular variation by isoporic lines or lines of equal annual change. The geophysical significance of the movement of these lines is indicated. New Zealand air navigation responsibilities are described for supplying information about magnetic declination or variation of the compass in the Pacific from lat. 20°N to lat. 60°S and from long. 150°E to long. 150°W. An account is given of the secular variation work in New Zealand from 1941 to 1950. Observations at secular variation stations are tabulated and the results are presented in the form of isoporic charts for each magnetic element as at epoch 1947.5. From the comparison of these charts with Vestine's world isoporic charts for 1942.5, it is obvious that New Zealand is subject to only a very small part of a very wide regional pattern of secular variation. The mean secular changes for ten places in New Zealand have been determined from 1903.5 to 1945.5 and compared with the values shown by the 1947.5 isoporic charts. The results show that for navigation purposes it is necessary to ensure continuity of the secular variation programme in magnetic survey work in New Zealand. *Subject Headings:* **1. Magnetic secular variations 2. New Zealand.**—*Author's abstract.*

9J–78 523.74:550.384

Dauvillier, Alexandre, **Sur le mécanisme de l'activité solaire.** [The mechanism of solar activity.] *Académie des Sciences, Paris, Comptes Rendus*, 246(13):1945–1947, March 31, **1958.** 2 refs. **DLC**—The author indicates how the combination of two mechanical effects, residues of the solar system genesis, generate polarization of magnetic fields reversing in accordance with Hale's rule and drifting to the equator over a period of 22 yrs. The mechanism is investigated through the observation of sunspots up to a latitude of 72°. *Subject Headings:* **1. Solar activity 2. Polarized magnetic fields.**—*A.V.*

9J–79 550.38

Dauvillier, A., **Sur l'origine et le maintien du géomagnétisme, sa variation séculaire et ses inversions.** [The origin and the maintenance of geomagnetism; its secular changes and its inversions.] *Académie des Sciences, Paris, Comptes Rendus*, 246(9):1354–1356, March 3, 1958. 3 refs. **DLC**—The author points out how these four problems resolve in only one, the solution of which is searched in the thermoremanent magnetization of basalts through the magnetic field issued from the sun's corpuscular radiation. *Subject Headings:* **1. Earth's magnetism 2. Geomagnetic secular change.**—*A.V.*

9J–80 550.384.

Dias, A. A. de Mendonça (*Natl. Met. Serv., S. Miguel, Azores, Portugal*), **A hypothetical model of the geomagnetic secular variation in Western Europe and the North Atlantic.** *Indian Journal of Meteorology and Geophysics*, Delhi, V. 5, Spec. No.: 89–95, Dec. **1954.** 4 figs., 4 tables, 8 refs. **DWB**—The analysis of historic values of the geomagnetic declination for various stations and of the inclination for London led to a hypothetical model of the geomagnetic secular variation in W. Europe and the N. Atlantic, which is submitted in this paper. In respect to this area, the secular variation of the earth's magnetic field is explained by a movement of the main field, as a whole, which is concentric to the globe. The trajectory of the north magnetic pole in this planetary movement is shown in a fig. and subsequently discussed. An attempt to apply this model to the whole globe is also submitted. If such a planetary movement is accepted, the conclusion is that, at each moment, the globe would be divided into two separate zones: one—$\triangle^I$ with decreasing values of I and the other $+\triangle^I$ with increasing values. At the present time—$\triangle^I$ would cover the American equatorial region and $+\triangle^I$ the Asian-Australian region. The isoporic chart in Fig. 3 does not show the same regularity as in Fig. 4. Therefore, it will be necessary to consider, simultaneously with the planetary variation, independent regional phenomena for the foci of rapid variation $\triangle^I$ (Fig. 3). The antipodal distribution of foci of the same sign seems to exclude the possibility of a planetary cause of their variations. It appears that the planetary variation could be considered as being connected to the hypothetical general circulatory movement in the earth's fluid core, and the actual foci shown in Fig. 3 might have their origin in subsidiary eddies set up in the same general circulation, giving rise to separate fields—each one with independent variations $\triangle^I$. *Subject Headings:* **9. Geomagnetic secular variations 2. Geomagnetic declinations 3. Western Europe 4. North Atlantic.**—*Author's abstract.*

9J–81 550.384.1

Errulat, Friedrich, **Die Erde als Magnet.** [The earth as a magnet.] *Naturwissenschaftliche Rundschau*, 4(9):391–394, Sept. **1951.** 3 figs. **DWB**—A discussion of the earth's magnetic field and its causes. The permanent field originates in the interior; short-period variations and magnetic storms in the ionosphere. UV radiation and charged corpuscles from the sun both play a part. The tracks of particles in the ionosphere are illustrated. Secular variation of the general field may be due to thermal changes in the interior of the earth. Recent techniques are briefly described. *Subject Headings:* **1. Earth's magnetic field 2. Magnetic secular variations.**—*C.E.P.B.*

9J–82 550.384.3

†*Gaibar-Puertas, C., **Fluctuaciones experimentadas por la intensidad de la fuerza geomagnética durante el periodo 1885–1950.** [Fluctuations in the intensity of the geomagnetic force during 1885–1950, Pt. 1.] *Revista de Geofísica*, Madrid, 12(48):255–305, Oct./Dec. **1953. Pt. 2,** *Ibid.*, 13(49):1–36, Jan./March **1954.** 12 figs., 30 tables, 38 refs. Spanish and English summaries p. 255–257. **DWB**—Geomagnetic (F) data for 99 stations throughout the earth from 1843 to 1950, have been used to study the secular variations in geomagnetic force of the earth as a whole. The globe was divided into 8 equal sectors and data averaged for each sector. Elaborate tabular and graphical analysis show increasing magnetism 1885–1895 and 1915–1941, and demagnetization from 1895–1915 and 1941–50. An average of 48 yrs is assumed for the recent cycles. Causes are treated at length, as well as local and general variations. *Subject Headings:* **1. Geomagnetic secular variations 2. Long period records.**—*M.R.*

9J–83 550.384.1

Haalck, H., **Über die Ursachen des magnetischen Rindenfeldes der Erde.** [On the causes of the magnetic crustal field of the earth.] *Beiträge zur Geophysik*, 62(3):208–221, **1952.** 3 figs., 7 refs. **DWB**—The geomagnetic field is made up of a "core field" and a smaller "crustal field." The latter is due mainly to geoelectric currents in the deeper parts of the crust, partly to the magnetism of the shallower crustal rocks. It can be resolved into a clockwise American and an anticlockwise African–Australian current system, coinciding with great geosynclines. Secular variations are attributed to changes in the crustal field only and therefore cannot involve large reversals. *Subject Headings:* **1. Geomagnetic field 2. Magnetic secular variations.**—*C.E.P.B.*

9J–84 550.384.3

Hope, E. R. (*Defence Research Board, Ottawa, Canada*), **Rotation, pulse-disturbance, and drift in the geomagnetic secular variation.** *Journal of Geophysical Research*, Wash., D. C., 62(1):29–42, March **1957.** 6 figs., 18 refs. **DLC**—The *westward drift* of surface geomagnetic patterns (the rate of which is about 30° of longitude per century) has at least one superimposed *rotation* of period ~480 years, and possibly another of period ~800 years; these are phenomena of a peculiarly localized nature. The 480-year rotation is demonstrable not only in the curves of declination *versus* dip, but also in the isoporic patterns. A strong *pulse-disturbance* which occurred in the relative rotation of the terrestrial core, and therefore in the westward drift, is shown to affect the 480-year rotation in a manner which helps to clarify the relationships. *Subject Headings:* **1. Geomagnetic secular variations 2. Geomagnetic drift.**—*Author's abstract.*

9J–85 550.384

Hope, E. R. (*Defence Research Board, Ottawa, Canada*), **Westward drift and cyclic secular variation.** *Journal of Geophysical Research*, Wash., D. C., 62(2):241–253, June **1957.** 5 figs., 4 tables, 18 refs. **DLC**—In previous papers (Hope, 9J–84), the rotary motion of the magnetic needle as displayed in Bauer's curves of secular variation was discussed on a descriptive basis. The present paper is an attempt to discuss the mechanism, and to relate it to the general westward drift of the surface geomagnetic field. The interpretation of the spherical harmonic analyses is considered. The essential conclusion is that the drift-rotation of the surface of the terrestrial core must be zonal, like that of the solar surface. This conclusion aids in accounting for the Bauer rotation. *Subject Headings:* **1. Geomagnetic field drift 2. Westward drift of magnetic field 3. Harmonic analysis.** —*Author's abstract.*

9J–86 550.384.3

Kalinowska, Zofia, **Some remarks on the secular variations of the earth's magnetic field in Poland.** *Acta Geophysica Polonica*, Warsaw, 1(3/4):208–217, **1953.** 5 figs., table, 10 refs. Polish summary p. 216–217. **DWB**—Annual means of geomagnetic elements observed at the Świder Observatory in Poland over the period 1921–50 are communicated and compared with simultaneous values at other European stations, showing essentially the same trends. *Subject Headings:* **1. Geomagnetic secular variations 2. Świder Observatory, Poland.**—*A.A.*

9J–87 550.384.3

Lowes, F. J. and Runcorn, S. K., **The analysis of the geomagnetic secular variation.** *Royal Society of London, Philosophical Transaction, Series A, Math. and Physical Sciences*, 243(871):525–546, Aug. 16, **1951.** 7 figs., 3 tables, refs. **DWB**—Analysis confirms that the origin of the geomagnetic secular variation must lie in the core of the earth, most probably near the surface. Twelve vertical dipoles were found. *Subject Heading:* **1. Geomagnetic secular variations.**—*A.A.*

9J–88 550.384

Lehnert, B. and Little, N. C. (*both, Royal Inst. of Tech., Stockholm*), **Experiments on the effect of inhomogeneity and obliquity of a magnetic field in inhibiting convection.** *Tellus*, Stockholm, 9(1):97–103, Feb. **1957.** 3 figs., table, 8 refs., 8 eqs. **DLC**—Two experiments are described on the inhibition of convection in a magnetic field. In the first experiment a layer of mercury is placed in an inhomogeneous magnetic field and heated from below. Photographs show convection where the field is weak, but indicate no motion where the field is strong. The boundary between these two regions corresponds to a critical magnetic field in agreement with current theory. The boundary is well defined, showing that the onset of convection is sensitive to variations in the magnetic field. In the second experiment with a homogeneous field, varied in direction from vertical to horizontal, it is the vertical component which controls the onset of motion. A strong horizontal field does not inhibit convection but causes motion in narrow cells elongated in the direction of the field. *Subject Headings:* **1. Magnetic field effects on convection 2. Convection.**—*Authors' abstract.*

9J–89 550.384.3

Mauersberger, P., **Zur Bestimmung des äusseren Anteils des geomagnetischen Hauptfeldes.** [Determination of the external part of the main geomagnetic field.] *Beiträge zur Geophysik*, 65(3):191–206, **1956.** 14 refs., 24 eqs. German and English summaries p. 191. Also his: **Das mittel der Energiedichte des geomagnetischen Hauptfeldes an der Erdoberfläche und seine säkulare Änderung.** [The mean energy density of the main geomagnetic field at the earth's surface and its secular variation.] *Ibid.*, p. 207–215. table, 4 refs., 11 eqs. German, English and French summaries p. 207. **DLC, DWB**—The first paper shows that the usual way of analyzing the earth's main magnetic field by spherical harmonics is not suitable to separate a possible external source from the inner source of the field. In the second paper, the mean energy density of the main geomagnetic field is calculated as $80\times10^{-4}\pm4\times10^{-5}$ erg/cm^3. In 1845, the value was 88×10^{-4} and

since then it has steadily fallen, owing to a decrease of the dipole field. *Subject Headings:* **1. Geo magnetism 2. Magnetic secular variations.**—*C.E.P.B.*

9J–90 550.384.

*Nagata, Takesi (*Geophys. Inst., Tokyo Univ.*) and Rikitake, Tsuneji (*Earthquake Res. Inst. Tokyo Univ.*), **Geomagnetic secular variation during the period from 1950–1955.** *Journal of Geo magnetism and Geoelectricity*, Tokyo, 9(1):42–50, March **1957.** 4 figs., 2 tables, 10 refs. **DWB**— The geomagnetic secular variation during the period from 1950 to 1955 is estimated on the basis o annual mean values of the geomagnetic field at some seventy magnetic observatories distributed all over the earth. Judging from the spherical harmonic analysis of the variation, it seems likely that the magnetic moment of the earth's dipole is still decreasing. *Subject Headings:* **1. Geomagnetic secular variations 2. Earth's dipole moment.**—*Authors' abstract.*

9J–91 550.384.3

Pramanik, S. K. (*Met. Off., Poona, India*), **Secular variation of the magnetic field at Colaba and Alibag.** *Journal of Geophysical Research*, 57(3):339–355, Sept. **1952.** 6 figs., 8 tables, 5 refs. **DWB**—We have data of magnetic observations at Colaba, Bombay, from 1846 to 1905, and at Alibag, 18 mi to the south, from **1904** onward, with two years of comparative observations during 1904 and 1905. Moos had studied in 1910 the secular variations of the magnetic field with data up to 1905. In view of the changes in the magnetic field and the very large amount of data collected since, a further study was undertaken. The value of H has been increasing continuously since 1916, and it is likely that the increase will continue at least for some more years. The westward drift of declination commenced in 1879 and is still continuing. The rate of drift, however, has decreased during the last 5 yrs, and within the next few years it may begin to return eastward or move westward at an increased rate. The vertical force had been continuously increasing from 1853 and it reached its maximum value in 1937, after which there was a fall for some years, but the falling tendency appears to have been arrested and the vertical force may again begin to increase. During the first six solar cycles, the average values of H, ΔH, and $\Delta' H$ are greater during sunspot minimum years than during sunspot maximum years, but this does not hold during the last three cycles. No periodicity of about 11 yrs was apparent in the curves representing the differences between the observed and calculated values of H, D, and V or in the curves representing ΔH, $\Delta' H$, ΔD, $\Delta' D$, ΔV, and $\Delta' V$, and no parallelism was noticeable between these curves and the sunspot curve. *Subject Headings:* **1. Magnetic secular variations 2. India.**—*Author's abstract.*

9J–92 550.384.3

Procopiu, Stefan (*Iassy Univ., Rumania*), **Le moment magnétique de la terre a commencé à croître.** [The earth's dipole moment has started increasing.] *Journal of Geophysical Research*, 60(1):114, March **1955.** eq. In French. **DWB**—Bullard (*see* 9J–63) has shown that the geomagnetic field decreased for 100 yrs up to 1932 and has increased since then. Puertas (1951) in Madrid arrived at similar conclusions. The author, in an article published in *Bulletin de l'Ecole Polytechnique de Iassy*, 2(2):457–70, **1947,** analyzed variation of terrestrial magnetism in Rumania from 1772 to 1947 and showed that the field (G) had decreased until 1932 (minimum) and since then has increased, G being the local magnetic constant (Bauer, L. A.) and represented by $G=\sqrt{H^2+1/4Z^2}=H\sqrt{1+1/4tg^2 I}$. *Subject Headings:* **1. Geomagnetic secular variations 2. Geomagnetic field 3. Earth's dipole moment 4. Iassy, Rumania.**—*M.R.*

9J–93 550.384.3 (436)

*Toperczer, M., **Der Verlauf der erdmagnetischen Elemente in Wien, 1851 bis 1950.** [The course of the geomagnetic elements in Vienna, 1851–1950.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):231–249, **1952.** 3 tables, 6 refs. German, English, French summaries p. 231. **DWB**—The three series of geomagnetic observations in Vienna are described and reduced to a uniform set of annual values of D, H and I, the rectilinear components X, Y, Z, and the total intensity; smoothed values are also given. The homogeneous Prague series of H used in the discussion is also given. *Subject Headings:* **1. Magnetic secular variations 2. Vienna, Austria 3. Prague, Czechoslovakia.**—*C.E.P.B.*

9J–94 550.384.3

*van Wijk, A. M. and Burger, J. A. N., **Secular variation of the magnetic elements in South Africa, 1939–1948.** *Journal of Geophysical Research*, 55(1):57–64, March **1950.** 2 tables, 3 refs. **DWB**—Gives a table of magnetic elements measured in a field survey in 1947–1948 and differences from 1938–1939. *Subject Headings:* **1. Magnetic secular variations 2. South Africa.**—*C.E.P.B.*

9J–95 550.384

Vestine, E. H. (*Carnegie Inst., Wash., D. C.*), **Geomagnetic field.** (In: Bates, D. R., (*ed.*), **The earth and its atmosphere.** N. Y., Basic Books, **1957.** p. 88–96. fig., table.) **DLC**—The

arth's magnetic field, its secular changes in historical and prehistorical time, causes of the main ield and minor variations (during "storms," etc.) are briefly treated. *Subject Heading:* **1. Geo-nagnetic field.**—*M.R.*

9J–96 550.384.3

Walker, George B. and O'Dea, Patrick L., **Geomagnetic secular-change impulses.** *American Geophysical Union, Transactions*, 33(6):797–800, Dec. **1952.** 2 figs., table, 6 refs. **DWB**—Secular-hange impulses in magnetic declination, dip, and horizontal intensity, derived from world-wide bservatory data, tend to congregate around certain years (epochs). This tendency is examined tatistically. As indications of the character of secular change, the impulses are well suited for use n the development of isoporic charts. Using a selected group of 80 observatories, precise impulses vere determined. These promise to be of value in investigations of the nature of secular change. *Subject Heading:* **1. Magnetic secular variations.**—*Authors' abstract.*

MAGNETIC ACTIVITY

9J–98 550.386.6

*Bossolasco, Mario (*Milan*), **Sur les perturbations magnétiques à Mogadiscio.** [Magnetic erturbations at Mogadiscio.] *Geofisica Pura e Applicata*, 20:46–49, July/Dec. **1951.** fig., table, 5 refs. English summary. **DLC**—The comparison of the geomagnetic *K*-indices for Mogadiscio with the corresponding K_p for the whole earth, during the 2nd International Polar Year 1932–33, allows deduction of some features of the equatorial geomagnetic activity. Furthermore, evidence indicates that the geomagnetic disturbance at Mogadiscio is normal in *H* and *D*, while it appears slightly abnormal in *Z*. *Subject Headings:* **1. K-index 2. Mogadiscio, Italian Somaliland.**—*Author's abstract.*

9J–99 550.386.6

Crichton, J., **The K-index of geomagnetic activity at Eskdalemuir, 1940–47.** *Journal of Geophysical Research*, 54(3):275–276, Sept. **1949.** 2 figs. Abstract p. 275. **DLC**—The K character index at Eskdalemuir is made up of 89% K_H, 10.5% K_D and 0.5% K_V. *Subject Headings:* **1. K-index 2. Geomagnetic activity 2. Eskdalemuir, Scotland.**

9J–100 550.386

Duclaux, Françoise and Leprêtre, Bernard, **Etude statistique des crochets magnétiques à Tamanrasset.** [Statistical study of the magnetic jumps at Tamanrasset.] *Académie des Sciences, Paris, Comptes Rendus*, 246(8):1243–1245, Feb. **24, 1958.** **DLC**—Statistical study of the jumps observed at Tamanrasset, Algeria. These included: secular, annual and diurnal variations; jumps occurring during the night and applicability of MACNISH's law; amplitudes; study of particular phenomena called "false jumps"; their variations; analogy of amplitudes; survey of the durations of the phenomena and of the direction of the disturbance vector. An analysis of two cases is included. *Subject Headings:* **1. Magnetic jumps 2. Magnetic variations 3. Tamanrasset, Algeria.**—*A.V.*

9J–101 550.386.6

Giorgi, M. and Molina, F., **Sugli indici "K" per il 1955 dell'Osservatorio magnetico di Gibilmanna (Sicilia).** [On the K-index for 1955 at the Gibilmanna, Sicily, Magnetic Observatory.] *Annali di Geofisica*, Rome, 9(2):179–194, April **1956.** 6 figs., 5 tables, 12 refs., eqs. Italian and English summaries p. 192–194. **DLC**—"K" indices 1955 of Gibilmanna Observatory (Sicily) are given. Some interesting features of the mean annual behavior and of the mean diurnal variation of "K" indices for the groups of four months NDJF (winter), MASO (equinoxes), MJJA (summer) are described. In so far as the annual behavior is concerned, the equinoxial growth has been noted, while in the diurnal variation the rise of disturbances in afternoon and evening hours, characteristic of the European region, has been pointed out. Moreover it is found: 1) the amplitude of the diurnal variation of "K" indices in winter is greater than in summer; 2) the summer maximum occurs before winter and equinoxial maxima. The frequency of each "K" indice in each interval for the three groups of months (NDJF), (MASO), (MJJA) has been calculated; greater values of the frequency for $K \geq 4$ in the afternoon and evening have been found. Range-volumes of Gibilmanna, Tucson and Watheroo at the same geomagnetic latitude are compared. The ratios of horizontal to vertical component of Gibilmanna are very similar to those of Tucson as calculated by Bartels and coworkers. This result is discussed also with reference to an eventual influence of the electric conductivity of deep layers. Finally the changes of "range-volumes" for $K = 4$ during the day have been studied and a clear diurnal variation has been found, specially for the D component, which shows its minimum and maximum in 3th and 7th interval, respectively. *Subject Headings:* **1. K-index 2. Geomagnetic activity 3. Gibilmanna, Sicily.**—*Authors' abstract.*

9J–102 550.386.6(411)

***Indices of geomagnetic activity of the observatories Abinger (Ab), Eskdalemuir (Es), and Lerwick (Le), January to December 1950.** *Journal of Atmospheric and Terrestrial Physics*, London: 1(4):254–260, **1951.** all tables. Also: **Indices . . . August to December 1951.** *Ibid.*, 2(3):196–199, **1952.** tables. **DWB**—Tabular data arranged under the following headings (representing the three observatories, respectively): Ab range for K = 9:500 y; Es range for K = 9:750 y; Le range for K = 9:1000 y. The daily K-indices are given for 3 hr. intervals (from 00–03 hrs to 21–24 hrs) together with daily totals, in the 12 monthly tables. *Subject Headings:* **1. Magnetic character figures 2. K-index 3. Geomagnetic data 4. Scotland.**—*W.N.*

9J–103 550.386.6

Lewis, R. P. Waldo and McIntosh, D. H. (*both, Met. Office, Edinburgh*), **A universal time component in geomagnetic disturbance.** *Journal of Atmospheric and Terrestrial Physics*, London: 4(1/2):78–80, **1953.** fig., 5 refs. **DWB**—Evidence is obtained of a Universal Time component in the diurnal variation of geomagnetic disturbance from the analysis of K-index figures for selected observatories. A possible interpretation of the results is given in terms of the position of the earth's magnetic axis relative to the system of sun and earth and its associated planes. *Subject Headings:* **1. Geomagnetic disturbances 2. Universal time component 3. K-index.**—*Authors' abstract.*

9J–104 550.386.0

Malurkar, S. L. (*Dir., Colaba & Alibag Obs.*), **Three-hourly indices of geomagnetic activity: Magnetic Observatory, Alibag, Bombay.** *Indian Journal of Meteorology and Geophysics*, Delhi: 6(1):80, Jan. **1955.** Graph (fold.). **DWB, DLC**—Table gives three-hourly K-indices for each day of the months July, Aug. and Sept. 1954. *Subject Headings:* **1. K-index 2. Geomagnetic activity 3. Alibag, India.**—*I.L.D.*

9J–105 550.386.6

*Schneider, Otto (*Argentine Nat. Met. Ser.*), **Rastros de un efecto lunar no eliminado en los indices *k* de actividad geomagnética.** [Indications of a lunar effect uneliminated in the *k* indexes of geomagnetic activity.] *Meteoros*, Buenos Aires, 3(2/3):135–139, April/Sept. **1953.** 3 tables, 5 refs. English summary p. 135. **DWB**—It is shown that the three hour indices *k* of geomagnetic activity contain a small semiannual variation on quiet days (with a daily total of $k_w < 10$) of the southern summer for the period 1940–1948. Tables give average three hourly and daily values of *k* at Pilar Observatory for 195 days grouped according to six lunar phases; the lunar variations of k_w. The semimonthly range of the daily mean values at Pilar rises to 0.41 units of *k*, and of k_w approximately 1/8. The semimonthly wave of daily means at Pilar is shown to be due mainly to the lunar influences during local day hours corresponding to Greenwich intervals 5, 6 and 7. The phenomenon described in this study does not express the total geomagnetic variation *L* in Pilar. The values *k* at Apia, Samoa do not show any lunar influence. *Subject Headings:* **1. Geomagnetic activity 2. Lunar variations 3. K-index 4. Pilar Observatory, Córdoba, Argentina.**—*I.L.D.*

TELLURIC CURRENTS

9J–106 550.387

Ádám, Anton and Verö, Josef, **Das Erdstrom-Observatorium bei Nagycenk (Ungarn).** [The Earth Current Observatory at Nagycenk, Hungary.] *Geofisica Pura e Applicata*, Milan, Vol. 39:126–151, Jan./April **1958.** 30 figs., 2 tables, 10 refs. German and English summaries p. 126. **DLC**—In the first part of the article, the writers (after brief historical note) give the location of the telluric observatory, established during the IGY near Nagycenk (Hungary), and its technical set up. The second part is an analysis of the data which shows the distribution of the different periodic variations. The telluric equivalents of magnetic phenomena (bay, storm, etc.) and the basic principles of the classification are specified. *Subject Headings:* **1. Earth Current Observatory, Nagycenk, Hungary 2. Telluric currents 3. Geomagnetic variations 4. Nagycenk, Hungary.**—*From authors' abstract.*

9J–107 550.387

Beaufils, Yvonne; Gibault, Gaston and Kunetz, Geza, **Variations rapides dans les courants telluriques et le champ magnétique terrestre.** [Short period variations in telluric currents and in the earth's magnetic field.] *Académie des Sciences, Paris, Comptes Rendus*, 253(2):198–200, July 16, 1952. 2 figs., 4 refs. **DWB**—Simultaneous measurements of telluric currents and of the earth's magnetic field, made by the Compagnie Générale de Géophysique and the Institut de Physique du Globe de Paris, are reported to have shown excellent agreement between all components measured and especially between the EW component of telluric currents and the horizontal component of the

agnetic field. Records obtained on March 22, 1952 are presented. Diurnal variation in magnetic scillation is discussed and illustrated. *Subject Headings:* **1. Telluric currents 2. Magnetic field ariations 3. Champagne, France 3. Chambon-la-Forêt, France.**—*G.T.*

9J–108 550.387

Schumann, W., **Über die theoretische Erfassbarkeit der Erdströme.** [Theoretical interretation of the earth current.] *Zeitschrift für Meteorologie*, 3(1/2):39–42, Jan.–Feb. **1949.** 7 refs., 3 eqs. German summary p. 39. Also: Schmitz, H. P., **Über Erdstrommessungen in anisotropem ntergrund und die Bedeutung theoretischer Überlegungen zur Stromermittlung.** [On earth urrent measurements in anisotropic ground and the importance of theoretical considerations to urrent estimation.] *Ibid.*, 3(3):78–79, March, **1949. DLC**—Schumann argues (against Schmitz, *eitschrift für Meteorologie*, 2:210–216, **1948**) that the lack of quantitative agreement between easurements of earth current and calculations from variations of earth's magnetic field is due ainly to anisotropy of the conducting layers. A difficult mathematical paper. Schmitz replies hat Schumann's objections are unfounded; theoretical considerations are of value as a basis for alculation. *Subject Heading:* **Earth currents.**—*C.E.P.B.*

MAGNETIC SURVEYS

9J–109 550.388:551.507.361

Heppner, J. P.; Stolarik, J. D. and Meredith, L. H. (*all, U. S. Naval Research Lab., Wash., D. C.*), **The earth's magnetic field above WSPG, New Mexico, from rocket measurements.** *Journal f Geophysical Research*, Wash., D. C., 63(2):277–288, June **1958.** 7 figs., 15 refs., eq. **DLC**—The bsolute magnetic field was measured from ground level to an altitude of 163 km in this first rocket light of a proton precessional magnetometer. The change in field with altitude differs significantly rom that of a dipole. The field was typically quiet at firing time and an ionospheric discontinuity vas not detected. *Subject Headings:* **1. Rocket geomagnetic sounding 2. Vertical magnetic field listribution 3. White Sands, New Mexico.**—*Authors' abstract.*

9J–110 550.389:523.78

Astbury, N. F., **Micro-magnetic variations during the solar eclipse of February 25, 1952.** *Nature*, London, 170(4315):68–69, July 12, **1952.** fig. **DWB**—Variations of horizontal magnetic ield at Khartoum were recorded. They are attributed to changes in the ionosphere. *Subject Headings:* **1. Eclipse effects on geomagnetic field 2. Solar eclipse, Feb. 1952 3. Khartoum, Sudan.** —*C.E.P.B.*

9J–111 550.389

Block, L. and Herlofson, N. (*both, Royal Inst. of Tech., Stockholm*), **Numerical integration of geomagnetic field lines.** *Tellus*, Stockholm, 8(2):210–214, May **1956.** table, 4 refs., 7 eqs. **DLC**—123 geomagnetic field lines have been integrated by an electronic computer, taking into account lso the quadrupole terms of the potential. A table gives the coordinates of the two points of ntersection, one in the Northern and one in the Southern Hemisphere, between the earth's surface nd each calculated field line. *Subject Heading:* **1. Magnetic field computations.**—*Authors' abstract.*

9J–112 550.389.1(51)

*Chen, Parker C. and Liu, Ching-Ling, **Preliminary report on the results of geomagnetic survey n China, 1946–1947.** *Academia Sinica. Institute of Meteorology, Scientific Papers, Contribution, 72, 1948.* Reprint from *Chinese Geophysical Society, Journal*, 1(1):78–87, June **1948.** mostly ables. **DWB**—Results obtained at 47 stations (16 in Szechuan, 21 along Yangtze, and 10 on South Coast) in 1946 and 1947, using a set of Askania portable theodolite magnetometers recalibrated Dec. 15, 1945 to Jan. 10, 1946 at the Institute of Physics near Chungking. Values of D, I, and H (absolute and sometimes diurnal variations) are given for each station. *Subject Headings:* **1. Geomagnetic surveys 2. China.**—*M.R.*

9J–113 550.389.5(675)

*Heinrichs, G., **Treize années d'observations magnétiques à Elisabethville: 1938–1950.** [Thirteen years of magnetic observations at Elisabethville: 1938–1950.] *Belgian Congo, Service Météorologique, Bulletin*, No. 1:33–42, Jan. **1951.** tables. Dutch, English and German summaries p. 34–35. Mimeo. **DWB**—*Subject Headings:* **1. Magnetic observations 2. Elisabethville, Belgian Congo.**

9J–114 550.389.1(829.7)

Hernandez, Roberto P. J. and Besada, Eduardo M. (*both, Dept. de Geofísica, Servicio Met. Nacional, de Argentino*), **Mediciones geomagnéticas en la Isla Decepción.** [Geomagnetic measurements in Deception Island.] *Meteoros*, Buenos Aires, 5(1/2):55–86, Jan./June **1955.** 15 figs. (incl.

4 photos), 19 tables. English summary p. 55. **DWB, DLC**—During a period of nine mont (April to Dec. 1951), BESADA stayed at the Argentine Naval Base on Deception Island, being charge of maintenance of the local earthquake station, geomagnetic measurements and magnet field observations at as many spots of the island as could be covered. The present report gives t results of this campaign, and describes the general working arrangement, rules for observations, a special methods adopted to meet the particular circumstances. *Subject Headings:* **1. Geomagnet surveys 2. Deception Island, Antarctica.**—*Authors' abstract.*

9J–115 550.3

†Hoge, Edmond, **Considérations sur la distribution du magnétisme terrestre en Belgique.** [Co siderations on the distribution of terrestrial magnetism in Belgium.] *Belgium. Institut Roy Météorologique, Miscellanées*, Fasc. 42, **1951.** 8 p. 19 refs. **DWB**—A summary of research Belgium since 1900 which would shed light on the terrestrial magnetic conditions in Belgium. N data are included, but important anomalies or conclusions drawn from data are listed and numerou pertinent studies cited. *Subject Headings:* **1. Magnetic field distribution 2. Belgium.**—*M.R.*

9J–116 550.389.

Keränen, J., **The variation of the compass magnetic declination 1950 (scale 1:2 milj).** *Geo physica*, Helsinki, 5(1):50–52, **1952.** **DWB**—A committee of geophysicists from Norway, Finlan Sweden and Denmark has prepared a general chart of magnetic declination for the early part 1950. A total of 11,254 observation stations were included in the network for all of Scandinavia Regions of disturbance are indicated. Later, general charts of the horizontal and vertical intensit components of geomagnetic force will be prepared in a similar way. These charts are the first their kind ever prepared. *Subject Headings:* **1. Magnetic declination 2. Magnetic charts 3. Scan dinavia.**—*M.R.*

9J–117 550.38

Mayaud, Pierre-Noël, **Position au 1er janvier 1952 du pôle magnétique Sud.** [Position of th South Magnetic Pole on Jan. 1, 1952.] *Académie des Sciences, Paris, Comptes Rendus*, 236(11):1189 1191, March 16, **1953.** refs. Also his: **Le pôle magnétique Sud en 1952 et les déplacements com parés des pôles Nord et Sud de 1942 à 1952.** [The South Magnetic Pole in 1952 and the displace ments of the North Pole compared with those of the South Pole from 1842 to 1952.] *Annales d Géophysique*, 9(3):266–276, July/Sept. **1953.** 8 figs., table, 15 refs. **DWB**—The first paper contains a synthesis of different measurements made at Adélie Land and Cape Denison (within the 89 isoclinal line). The position of the South Magnetic Pole as of Jan. 1, 1952 is determined as 68°7'S 143°E. The method of reductions and corrections applied to the data is explained and illustrated In the second paper the author gives more details of the material reported in his first note. He also examines polar displacements from known positions of the South Pole (1842, 1912, 1952) and Nortl Pole (1842, [1904], 1948). During the 110 year period, the displacement of the South Pole is found to have been twice as large as that of the North Pole. In both cases the N-S component of migration is of a much higher order than the E-W component. *Subject Headings:* **1. Magnetic declinations 2. Geomagnetic poles 3. Antarctic expeditions 4. Antarctica.**—*G.T.*

9J–118 550.389.523.7

*Morelli, C., **Sui fenomeni di magnetismo terrestre in dipendenza da quelli solari.** [Phenomena of the dependence of terrestrial magnetism on solar magnetism.] *Trieste. Istituto Geofisico, Pubblicazioni*, No. 240, **1948.** 19 p. 4 figs., 2 tables. Italian summary p. 19. **DLC.** Also issued as: *Accademia Nazionale dei Lincei, Problemi Attuali di Scienza e di Cultura, Quaderno*, No. 6.— Based on records of diurnal variation in geomagnetic elements made in Italy. Correlation shown to be good between solar activity and terrestrial phenomena such as auroras, cosmic rays, geomagnetic components, etc. A forecast of solar activity (based on periodogram analysis 1877–1947) for period 1948–57 is presented on a graph. *Subject Headings:* **1. Solar-magnetic relationships 2. Geomagnetic forecasts 3. Italy.**—*M.R.*

9J–119 550.389

Nikol'skiĭ, A. P., **K voprosu o geograficheskom raspredelenii magnitnykh vozmushcheniĭ v Antarktike.** [Geographic distribution of magnetic disturbances in the Antarctic.] *Akademiia Nauk SSSR, Doklady*, 112(5):846–848, Feb. 11, **1957.** 2 figs., table, 5 refs. **DLC.** Trans. into English available from Special Libraries Association, Translation Center, John Crerar Library (Chicago), as its NRC-C-2337, and a different trans. as its R-1179.—Assumes that the spiral distribution of the magnetic disturbances occurring in the morning hours, which was derived from observations in the Arctic with the center at the pole of homogeneous magnetization, should hold also for the Antarctic. The difference should be that the spirals diverge counter-clockwise instead of clockwise. Available data from three Antarctic stations seem to support this conclusion. *Subject Headings:* **1. Geomagnetic disturbances 2. Antarctica 3. Arctic.**—*A.A.*

9J–120 550.389:523.74

*Oriol Cardus, **J., Nota relativa a la actividad solar y geomagnética, julio–sept. 1955.** [Note on ar and geomagnetic activity, July–Sept. 1955.] *Revista de Geofísica*, Madrid, 14(56):363–372, ./Dec. **1955.** 5 tables. **DWB, DLC**—In this regular feature, sunspot groups and associated nomena are described and tabulated (daily values of geomagnetic and solar activity and main urbances). *Subject Headings:* **1. Solar activity data 2. Solar-magnetic relationships 3. Ebro servatory, Spain.**—*M.R.*

9J–121 550.389

Pühringer, A., **Die magnetischen Elemente D, I, H und ihrer Isoporen für das Feld einer nogen magnetisierten Kugel.** [The magnetic elements D, I, H and their isomagnetic lines for field of a homogeneously magnetized sphere.] *Archiv für Meteorologie, Geophysik und Bio-natologie, Ser. A*, Vienna, 8(4):501–517, **1955.** 11 figs., 2 refs., 45 eqs. German, English and nch summaries p. 501. **DWB**—Equations for the magnetic elements and their isopors are ived for the field of a homogeneously magnetized sphere (a centric dipole), the curves of the magnetic lines are thoroughly discussed, and the singular points indicated. Furthermore, maps the isomagnetic lines were designed in orthogonal projection by which a very clear representation comes possible. Thus not only previous results found by CHAPMAN are confirmed, but moreover lear geometrical interpretation is given for the isogons and D-isopors. It is shown for the I-pors and H-isopors (for the latter ones in general) that the magnetic poles are not only to be nsidered as nonuniform ray-poles but also as points. *Subject Headings:* **1. Geomagnetism 2. Iso-gnetic lines.**—*Author's abstract.*

9J–122 550.389

Vorläufiger Bericht über die Beobachtungen am Adolf-Schmidt-Observatorium für Erd-agnetismus in Niemegk in der Zeit vom 1. September 1953 bis 31. August 1954. [Preliminary port on observations at the Adolf-Schmidt Observatory for Geomagnetism at Niemegk Sept. 1, 53-Aug. 31, 1954.] *Beiträge zur Geophysik*, Stuttgart, 6(4):313–327, **1955.** 3 figs., table. **DWB** Components X, Y and Z are shown graphically. Extensive tables give daily values of C, F and and 3-hourly values of K_2. *Subject Headings:* **1. Geomagnetic data 2. Niemegk, Germany.**—*E.P.B.*

PART III. REVIEWS, TRANSLATIONS, RECENT MONOGRAPHS, AND ANALYTICS FROM SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

American Geophysical Union: **Antarctica in the International Geophysical Year, based on a symposium on the Antarctic.** Contributions by A. P. Crary and others. *AGU Geophysical Monograph*, No. 1, 1956. 133 p. Review by W. Mörikofer in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 10(1):115, 1957. Review by M. M. Sweeting in *Journal of Glaciology*, London, 3(22):150, Oct. 1957. Review by A. K. Das in *Indian Journal of Meteorology and Geophysics, Delhi*, 8(3):351–352, July 1957. Review by J. M. Stagg in *Royal Meteorological Society, Quarterly Journal*, 83(358):562, Oct. 1957.

Aubert de la Rüe, Edgar; Bourliere, François and Harroy, Jean Paul: **The tropics.** N. Y., Alfred A. Knopf, 1957. 208 p. maps, illus., index. Price, $12.50. Review by Marston Bates in *Geographical Review*, 48(3):449–451, July 1958.

Bates, D. R., (ed.): **The earth and its atmosphere.** N. Y., Basic Books, 1957. 324 p. fi (Earlier ed. published under title: **The planet earth.** London, Permagon, 1957.) Review A. H. Cook in *Geophysical Journal*, 1(2):187–188, June 1958. Review by R. C. Sutcliffe *Royal Meteorological Society, Quarterly Journal*, 84(359):85–86, Jan. 1958. Review by Je Cabannes in *Annales de Géophysique*, Paris, 14(2):237–238, April/June 1958. (*See* 9.5–2, M 1958, *MAB*)

Best, A. C.: **Physics in meteorology.** London, Pitman, 1957. 159 p. 26 figs. Price, 18 s Review in *Weather*, London, 13(41):31–32, Jan. 1958. Review by A. W. Brewer in *Meteorological Magazine*, London, 87(1028):59–60, Feb. 1958.

Buedeler, Werner: **The International Geophysical Year.** Paris, UNESCO, 1958. 72 p. 17 ill Price, 3 sh. Review in *Science Progress*, London, 46(181):180–181, Jan. 1958.

Chalmers, J. Alan: **Atmospheric electricity.** London, Pergamon Press, 1957. 327 p. 64 fi Price, 63 sh. Review by B. J. Mason in *Science Progress*, London, 46(181):148–149, Jan. 19 (*For abstract on the original, see* 9.1–6, Jan. 1958, *MAB*)

Dietze, G.: **Einführung in die Optik der Atmosphäre** [Introduction to the optics of the atmosphere Leipzig, Geest & Portig, 1957. 263 p. 11 figs., 43 tables. Price, DM 29. Review by H. Hin peter in *Zeitschrift für Meteorologie*, 11(7):224, 1957. (*See* 8.8–13, Aug. 1957, *MAB*)

Dumont, R.: **L'ionosphère et l'optique géométrique des ondes courtes** [Ionosphere and geomet optics of short waves]. Paris, Dunod, 1958(?). Review in *La Météorologie*, No. 49:75, Ja March 1958.

Durst, C. S.: **A statistical study of the variation of wind with height.** *Great Britain. Meteorological Office, Professional Notes*, No. 121, 1957. 10 p. 3 figs., 10 tables, 6 refs., 5 eqs. Review by J. Parker in *Marine Observer*, London, 11(1):113–114, Jan. 1958. (*See* 9.1–121, Jan. 1958, *MA*

Fraser, Ronald G. J.: **Once round the sun: the story of the International Geophysical Year.** Ne York, Macmillan, 1957. 160 p. 38 figs. Review in *Science Progress*, London, 46(181):14 Jan. 1958. (*See* 9.2–16, Feb. 1958, *MAB*)

Flora, Snowden Dwight: **Hailstorms of the United States.** Norman, Univ. of Oklahoma Pres 1956. 201 p. 12 figs., photos, tables, foot-refs. Review in *Scientific American*, 197(1):17 173, July 1957. Review by Hoyt Lemons in *Geographical Review*, 47(4):605, July 1957. R view by H. H. Lamb in *Meteorological Magazine*, London, 86(1026):379–380, Dec. 1957. (S 8.6–8, June 1957, *MAB*)

Garland, John Henry (ed.): **The North American Midwest: a regional geography.** N. Y., Joh Wiley; London, Chapman & Hall, 1955. 252 p. 80 figs., maps, bibliog. p. 234–245. Pric $8.00. Review by Leslie Hewes in *Geographical Review*, N. Y., 57(1):145–146, Jan. 195 Review in *Scottish Geographical Magazine*, Edinburgh, 73(3):187, Dec. 1957. (*See* 9.7–1 July 1958, *MAB*)

many. Deutscher Wetterdienst: **Symposium über numerische Wettervorhersage in Frankfurt a.M., 23–28, Mai, 1956** [Symposium on numerical weather forecasting in Frankfurt, May 23–28, 1956]. Its *Berichte*, No. 38, 1957. 97 p. figs., tables, eqs. Review by Gusztáv Götz in *Időjárás*, Budapest, 62(1):50–53, Jan./Feb. 1958.

many. Deutscher Wetterdienst: **Vorträge über Frostschutz anlässlich der 1. Tagung der Arbeitsgemeinschaft Frostschutz am 22. November 1955 in Bonn [und der] Sonderbesprechung über die Technischen Erfahrungen des Deutschen Wetterdienstes im Frostschutz am 26. April 1956 in Mainz** [Papers on frost protection delivered at the first meeting . . .]. Its *Mitteilungen*, 3(16), 1956. 85 p. figs., tables, bibliogs. Resumé by G. A. Bull in *Nature*, London, 179(4558):519–520, March 9, 1957. (*See* 8.3–1, March 1957, *MAB*)

lske, C. L.; Bergeron, Tor; Bjerknes, Jakob A. V. and Bundgaard, Robert C.: **Dynamic meteorology and weather forecasting.** Published jointly by American Meteorological Society, Boston, and by Carnegie Institution of Washington, D. C., 1957. (Foreword dated 1949; manuscript submitted Feb. 1951.) 800 p. numerous figs., tables, eqs. Bibliog. at end of each ch. *Carnegie Institution of Washington, Publication*, No. 605. Review by F. Steinhauser in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 10(2/3):269–271, 1958. (*See* 8.7–5, July 1957, *MAB*)

lding. Edward William: **Generation of electricity by wind power.** London, Spon Ltd., 1955. 318 p. 101 figs. (incl. photos), bibliog. p. 295–305; refs. at end of most chapters, eqs. Review by F. Steinhauser in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, Vienna, 8(2):270–271, 1957. (*See* 7.11–5, Nov. 1956, *MAB*)

adbuch der Pflanzenphysiologie, Bd. 3, Pflanze und Wasser [Handbook of plant physiology, Vol. 3, Plants and water]. Ed. by O. Stocker. Berlin, Springer, 1956. 1073 p. 488 figs. Price, DM 248. Review by H. Walter in *Die Naturwissenschaften*, Berlin, 44(22):599–600, Nov. 15, 1957.

ernational Geophysical Year, 1957/1958. British National Committee: **Guide to IGY International Geophysical Year, 1957–8.** Foreword by Sir James Wordie. London, Methuen, 1957. 48 p. 24 figs. Price, 2 sh. 6 d. Review in *Science Progress*, London, 46(181):180, Jan. 1958.

nsson, Gunnar: **Glacialmorfologiska studier i södra Sverige** [Glaciomorphological studies in S. Sweden]. *Lunds Univ. Geogr. Institutionen, Avhandlingar*, No. 30, 1956. 407 p. maps, diagrs., illus. bibliog. Review by John Leighly in *Geographical Review*, N. Y., 48(1):144–146, Jan. 1958.

ser, T. R. (ed.): **Meteors.** Special supplement (vol. 2) to the *Journal of Atmospheric and Terrestrial Physics*. London, Pergamon Press, 1955. 204 p. numerous bibliogs. and illus. Review by C. Hoffmeister in *Die Naturwissenschaften*, Berlin, 44(15):455–456, Aug. 15, 1957. (*See* 7.7–1, July 1956, *MAB*)

ndrew, Wilfred George and Kerr, D.: **The climate of British Columbia and the Yukon territory.** Ottawa, Edmond Cloutier, 1955. 222 p. 54 figs., 8 photos, 101 tables. Review by L. C. W. Bonacina in *Geographical Journal*, London, 73(3):401, Sept. 1957. Review by Svenn Orvig in *Arctic*, Ottawa, 9(4):265, 1956. (*See* 8.5–23, May 1957, *MAB*)

per, Gerard P. (ed.): **The earth as a planet.** Chic., Univ. of Chic. Press, 1954. 751 p. figs., tables, photos, bibliogs. Review by Thomas Gold in *Science Progress*, London, 44(174):317–318, April 1956. (*See* 7.11–4, Nov. 1956, *MAB*)

nb, H. H.: **Meteorological results of the Balaena Expedition 1946–1947.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 94, 1956. 68 p. 10 figs., 5 plates, numerous tables, 44 refs. Review in *Nature*, London, 178(4531):461, Sept. 1956. (*See* 7.10–11, Oct. 1956, *MAB*)

, Douglas H. K.: **Climate and economic development in the tropics.** N. Y., pub. for the Council on Foreign Relations by Harper, 1957. 182 p. maps, diagrs., bibliog. Price, $3.50. Review by Marston Bates in *Geographical Review*, 48(3):449–451, July 1958. (*See* 9.5–8, May 1958, *MAB*)

tau, Heinz H. and Davidson, Ben (eds.): **Exploring the atmosphere's first mile: Proceedings of the Great Plains Turbulence Field Program, Aug. 1–Sept. 1953, O'Neill, Nebraska.** N. Y., Pergamon Press, 1957. 2 vol. (578 p.). Price, $20.00 both vol. Review by Robert A. McCormick in *American Geophysical Union, Transactions*, 39(3):502–503, June 1958. Review by M. A. Alaka in *World Meteorological Organization, WMO Bulletin*, 7(2):96, April 1958. Review in *Royal Meteorological Society, Quarterly Journal*, 84(360):197, April 1958. Review by G. Skeib in *Zeitschrift für Meteorologie*, 11(9):282, Sept. 1957. (*See* 9.3–1, March 1958, *MAB*)

ell, A. C. Bernard: **Meteor astronomy.** Oxford, Clarendon Press, 1954. 463 p. 186 figs., 175 tables, refs., eqs. Review by H. Spencer Jones in *Science Progress*, London, 44(174):318–320, April 1956. (*See* 7.3–18, March 1956, *MAB*)

son, B. J.: **Physics of clouds.** Oxford, Clarendon Press, 1957. 481 p. Price, 70 sh. (*Oxford Monographs on Meteorology*). Review by J. R. Atkinson in *Nature*, 181(4619):1298, May 10, 1958. (*See* 9.6–3, June 1958, *MAB*)

Mertins, H. O. (ed.): **Sturmwetterlagen bei Island, 1950–1954, 1, Synoptischer Teil. 2, Statistis Teil** [Weather conditions near Iceland, 1950–1954, Pt. 1, Synoptic part, Pt. 2, Statistical pa *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 12, 1957. 24 p. tables, 40 figs., diagrs. Review by Joachim Blüthgen in *Erdkunde*, Bonn, 11(3):247–248, Aug. 1957. Re in *Marine Observer*, London, 28(170):36, Jan. 1958. (*See* 8.9–30, Sept. 1957, *MAB*)

B. TRANSLATIONS AND RECENT MONOGRAPHS

TRANSLATIONS

Abramova, M. M.; Bol'shakov, A. F.; Oreshkina, N. S. and Rode, A. A.: **Evaporation of suspen water.** (Trans. of original Russian **Isparenie iz pochvy podveshennoĭ vlagi,** in *Pochvoved* Moscow, No. 2:27–41, 1956. 9 figs., table, 9 refs.) Trans. available Special Libraries sociation Translation Center (John Crerar Library, Chicago) as its R-3908

Artamonov, A. A.: **Method of predicting air temperature.** (Trans. of original Russian **Spo predvychisleniia temperatury vozdukha,** in *Meteorologiia i Gidrologiia*, Leningrad, No. 12:36– Dec. 1956. 2 figs., 3 tables, 6 eqs.) Trans. available for reference DWB (M24 A7841m (*For abstract on original Russian, see* 8.10–115, Oct. 1957, *MAB*)

Baur, Franz: **Situaciones generales meteorológicas de Europa.** (Trans. into Spanish of origi German **Musterbeispiele europäischer Grosswetterlagen** [Examples of European large-s weather situations] issued Wiesbaden, Dietrichsche Verlagsbuchhandlung, 1947. 35 p. charts, 2 tables.) Trans. issued as *Spain. Servicio Meteorológico Nacional, Publicacio Ser. A, (Memorias)*, No. 20:21–55, 1949. Available DWB. (*See* 1–56, Jan. 1950, *MAB*)

Dzhordzhio, V. A.: **Jet stream.** (Trans. of original Russian **Struĭnoe techenie,** in *Meteorologi Gidrologiia*, No. 6:49–60, June 1956. 8 figs., 61 refs., eqs.) Trans. available DWB (M5 D999je). (*See* 8.9–171, Sept. 1957, *MAB*)

Egorov, V. A.: **Certain problems of moon flight dynamics.** (Trans. of original Russian **O nekotory zadachakh dinamiki poleta k Lune,** in *Uspekhi Fizicheskikh Nauk*, Moscow, 63(1):73–1 Sept. 1957. 40 figs., 18 refs., 22 eqs.) Trans. issued as International Physical Index, I N. Y., **The Russian literature of satellites,** Pt. 1, issued 1958. p. 88–174. figs., etc. Tra available DWB (629.1388 I611ru).

Enenshteĭn, B. S. and Aronov, L. E.: **Experimental research into the natural electromagnetic fi of the earth in the frequency spectrum of 2–300 c/s.** (Trans. of original Russian **Ekspe mental'nye issledovaniia estestvennogo elektromagnitnogo polia zemli v spektre chastot ot 2 300 gts,** in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 1:62–70, 1957.) Trans. by Botcharsky issued in English language edition of the **Izvestiia,** *Bulletin of the Academy of Scien of the U.S.S.R., Geophysics Series* (issued by American Geophysical Union), No. 1:68–78, 19 4 refs., 14 figs. DWB

Girs, A. A.: **Transformation of types of atmospheric circulation and their analysis.** (Trans. original Russian **Preobrazovanie form atmosfernoĭ tsirkuliatsii i ikh analiz,** in *Meteorologii Gidrologiia*, Leningrad, No. 3:12–20, March 1956. 5 figs., 9 refs.) Trans. available DW (M13 G5288tr). (*See* 8.10–107, Oct. 1957, *MAB*)

Grundmann, Walter: **The Six thermometer.** (Trans. by L. P. Haslam of original German **Fl Flüssigkeitsthermometrie.** Source of original (p. 47–61) unidentified.) 11 p. typescri Photostat of 4 original figs. Trans. available DWB (M08.26 G889si).

Heisenberg, Werner: **On the statistical theory of turbulence.** (Trans. of original German **Z statistischen Theorie der Turbulenz,** in *Zeitschrift für Physik*, 124:628–657, 1948.) Trans. issu as *U. S. National Advisory Committee for Aeronautics, Technical Memorandum*, 1431, Jan. 19 36 p. 4 figs., foot-refs., 100 eqs. Trans. available DWB (629.1308 U585tm). (*See* 4A–9 Jan. 1953, *MAB*)

Hollmann, G.: **Curvature- and shearing-vorticity equation: the direction- and speed-divergen equation.** (Trans. of original German **Die Krümmungs- und die Scherungs-Vorticitygleichun die Richtungs- und die Geschwindigkeits-Divergenzgleichung,** in *Beiträge zur Physik d Atmosphäre*, Frankfurt a.M., 30(4):254–267, 1958. 4 refs., 84 eqs.) Trans. issued as German Deutscher Wetterdienst, Contract AF 61(514)-735c, Technical Note, No. 6, 1958? 17 Trans. available DWB (M09.312 G373r).

Koshelenko, I. V.: **Forecasting radiation fog.** (Trans. of original Russian **O prognoze radiatsionno tumana,** in *Meteorologiia i Gidrologiia*, Leningrad, No. 3:28–32, March 1956. 4 figs., 2 table 2 refs.) Trans. available DWB (M09.325 K86fo). (*See* 8C–100, March 1957, *MAB*)

Kosibowa, Stefania: **Studies of the upper layers of the earth's atmosphere.** (Trans. of the origin Polish **O badaniach wyzszych warstw atmosfery ziemskiej,** in *Przeglad Geofizyczny*, Warsa 1(1):67–76, 1956. 3 figs., table, 8 refs.) Trans. available DWB (M10.53 K86up). (*See* 8H 80, Aug. 1957, *MAB*)

istanov, L.: **Contribution to the theory of drop and crystal formation in the atmosphere.** (Trans. by Mary L. Mahler of original German **Beitrag zur Theorie der Tropfen- und Kristallbildung in der Atmosphäre,** in *Meteorologische Zeitschrift,* 58(2):37–45, Feb. 1941.) Trans. issued by U. S. National Advisory Committee for Aeronautics, available DWB (M74.1 K89co). (*See* C-43, March 1950, *MAB*)

ovich, M.: **Regulation of the water balance of irrigated fields by shelter belts as a means of decreasing irrigation rates.** (Translation of original Russian in *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.,* No. 2:29–44, 1954.) Trans. available Commonwealth Scientific & Industrial Research Organization, Information Service, 314 Albert St., East Melbourne C., 2 Victoria, Australia as its CSIRO 3765. 10 p.

kirov, A. E.: **Photoelectric method of investigating the distribution of particle size of precipitation.** (Trans. by J. Thompson of original Russian **Fotoelektricheskiĭ metod issledovaniia raspredeleniia razmerov chastits osadkov,** in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.,* No. 1:104–108, 1957.) Trans. issued in English language edition of the **Izvestiia,** *Bulletin of the Academy . . . Geophysics Series,* No. 1:104–119, 1957, issued by Amer. Geoph. Union. 3 figs., 5 tables, 9 refs.

tra, Sisir Kumar: **Verkhniaia atmosfera.** (Trans. by G. V. Rozenberg and E. A. Makarov into Russian of original English **Upper atmosphere,** 2d English ed. 1952.) Trans. issued Moscow, Izdat. Inostrannoĭ Literatury, 1955. 639 p. 302 figs., 37 tables, bibliog. p. 590–609, eqs. (*For abstract on 2d Eng. Ed., see* 4.8–15, Aug. 1953; *for abstract on Russian trans., see* 9.7–17, July 1958, *MAB*)

roumov, G. A.: **Free convection under the conditions of the internal problem.** (Trans. by S. Reiss of original Russian **Svobodnaia konvektsiia v usloviakh vnutrenneĭ zadachi,** issued by State Pub. House, Technico-Theoretical Literature, Moscow-Leningrad, 1952.) Trans. issued as *U. S. National Advisory Committee for Aeronautics, Technical Memorandum* 1407, April 1958. 233 p. 57+27 figs. and photos, 11 tables, bibliog. p. 186–189, numerous eqs. Trans. available DWB (620.1308 U585tm).

u, Walter: **Freezing nuclei content of the different air masses.** (Trans. by James Gough, Jr. and Valda Dreimanis of original German **Die Gefrierkerngehalte der verschiedenen Luftmassen,** in *Meteorologische Rundschau,* 7(11/12):205–211, Nov./Dec. 1954. 14 figs., 7 refs.) Trans. issued by American Meteorological Society under Contract AF 19(604)-1936 (in rough draft), June 1955. 27 p. refs., etc. Trans. available Special Libraries Association Translation Center, as its 57-2586. (*See* 6.6–260, June 1955, *MAB*)

uleĭkin, V. V.: **Essays on the physics of the sea.** (Trans. of original Russian **Ocherki po fizike moria,** issued Moscow, Akademiia Nauk, 1949. 334 p. 190 figs.) Trans. (reproduction of typescript), available DWB. (*See* 8–14, Aug. 1950, *MAB*)

RECENT MONOGRAPHS

rat, M.: **Pluviologie et aquidimétrie dans la zone inter-tropicale** [Analysis of rainfall and water supply in the inter-tropical zone]. *Institut Français d'Afrique Noire,* Dakar, No. 49, 1957. 80 p. 15 figs., numerous tables. (*To appear as* 9.11–15, Nov. 1958, *MAB*)

rrett, Robert B.: **Resistance of plastics to outdoor exposure (a condensation).** *U. S. Picatinny Arsenal, Dover, N. J., Technical Report,* No. 2102, Feb. 1955. 261 p. 2 figs., numerous tables.

ham, R. R., Jr.; Ackerman, B. and Brown, E. N.: **Hurricane cloud physics research.** Chicago. Univ. Dept. of Meteorology, Contract Cwb-9021, Final Report, Jan. 31, 1958. 70 p. figs., tables, refs.

rvinskas, Eduardas: **Antarktida** [Antarctic]. Vilna, 1957. 181 p. figs., photos, charts, 24 refs.

ead, M.; Mane, K. U. and Katsnelson, J.: **The climate of Israel.** *Israel. Meteorological Service, [Publications], Ser. E,* No. 2, 1954. 30 p. chart, table. In Hebrew.

eat Britain. Dept. of Scientific and Industrial Research: **Investigation of atmospheric pollution: a report on observations in the 10 years ended March 31, 1954. 27th report.** London, 1955. 206 p. tables. Also: **28th Report, for 1955.** 149 p. tables. Also: **Vol. 29, 1956.** 123 p. tables.

en, H. L. and Lane, W. R.: **Particulate clouds: dusts, smokes and mists: their physics and physical. chemistry and industrial and environmental aspects.** Princeton, N. Jersey, Van Nostrand, 1957. 425 p. 108 figs., 8 plates, refs. at end of each ch.

ishevskiĭ, I. D.: **Aktinometricheskie pribory i metody nabliudeniĭ** [Actinometric instruments and methods of observation]. Leningrad, Gidrometizdat, 1957. 414 p. 93 figs., tables, 75 refs., eqs.

ian Science Congress: **Symposium on development of power and water resources of West Bengal: a brief report.** *Indian Journal of Power and River Valley Development,* Calcutta, 7(9), Sept. 1957. Entire number devoted to report on this **Symposium.**

Kemp, Norman: **Conquest of the Antarctic.** N. Y., Philosophical Library, 1957. 152 p. phot
Khakhalin, V. S.: **Radiotekhnika v aerologii** [Radio engineering in aerology]. Leningrad, Gi
metizdat, 1957. 263 p. 100 figs., 13 tables, eqs.
Konček, Mikuláš: **Teplotné pomery Bratislavy** [Temperature conditions of Bratislava]. Bratisla
1956. 80 p. 27 figs., 47 tables, 44 refs. Russian, German and English summaries, p. 77–
Laĭkhtman, David L.: **Zadachnik po dinamicheskoĭ meteorologii** [Problems in dynamic meta
ology]. Leningrad, Gidrometizdat, 1957. 180 p. tables, eqs.
Leese, Horst: **Synoptisch-statische Untersuchungen über den Zusammenhang zwischen Höh
strömung und Luftdruckänderung am Boden** [Synoptical-statistical investigations on the relat
between upper air currents and atmospheric changes at the surface]. *Berlin. Freie U.
versität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 5(3), 19
55 p. 36 figs., 9 tables, 33 refs.
Ley, Willy: **Rockets, missiles and space travel.** Rev. and enl. ed. N. Y., Viking Press, 19
527 p. 85 figs., tables, bibliog.
Lutkovskiĭ, S. V.: **Obrazovanie l'da v ozerakh rekakh i moriakh** [Formation of ice in lakes, rivers a
seas]. Moscow, Akademiia Nauk SSSR, 1957. 114 p. 33 figs., 6 tables, 12 refs.
Mallan, Lloyd: **Space satellites.** N. Y., Fawcett Publications, Inc., 1958. 144 p. photos.
Meteorological Society of Japan, Tokyo: **75th Anniversary Volume of the appearance of the fi
Journal.** Ed. by Sigekata Syono et al. Pub. Nov. 1957. 402 p. figs., tables, refs., eqs.
Mollwo, Hans: **Klimawerte von Frankfurt/Main, 1857–1956** [Climate values of Frankfurt a.
1857–1956]. *Germany. Deutscher Wetterdienst, Berichte*, 6(43), 1958. 60 p. 45 tables, 9 r
Obedientova, G. V.: **Noveĭshie tektonicheskie dvizheniia i geomorfologicheskie usloviia sredn
Povolzh'ia** [Recent tectonic movements and geomorphological conditions of the Middle Volg
Akademiia Nauk SSSR. Institut Geografii, Trudy, Vol. 72, 1957. 99 p. 35 figs., bibli
p. 92–99.
Rawer, Karl: **The ionosphere: its significance for geophysics and radio communications.** Tra
from German by Ludwig Katz. N. Y., Frederick Ungar, 1957. 202 p. 72 figs., bibli
p. 191–198. 68 eqs. (*For abstract on* 1953 *German ed., see* 6D–297, April 1955, *MAB*)
Shternfel'd, A. A.: **Iskusstvennye sputniki Zemli** [Artificial earth satellites]. Moscow, Gos
Izdat. Tekhniko Teoreticheskoĭ Literatury, 1956. 179 p. 27 figs., 10 tables.
Solot, Samuel B. and Darling, Eugene M., Jr.: **Theory of large-scale atmospheric diffusion and
application to air trajectories.** *U. S. Air Force. Cambridge Research Center, Geophysi
Research Papers*, No. 58, June 1958. 3 vol. 10 refs.
Spaceflight (issued London by the British Interplanetary Society), Vol. 1, No. 1, Oct. 1956. Lat
issue seen, Vol. 1, No. 8, July 1958. Quarterly. Free to members of the Society. Patr
Moore, ed.
U. S. Office of Technical Services: **Soviet bloc International Geophysical Year information, Feb.
1958–Jan. 2, 1959.** Weekly. Price for projected series, to non-government scientists, $10.
from Office of Technical Services (order its *PB* 131-632).
Woodward, D. R.: **Availability of water in the U. S. with special reference to industrial needs
1980.** Thesis No. 143 (Resident Course, 1956/1957)—Industrial College of the Armed Forc
Wash., D. C., April 10, 1957. 74 p. 11 figs., map, 8 tables, 53 refs.
Zenker, Helmut: **Über Land- und Seewinde an der Küste der Insel Usedom und ihre bioklimatisc
Bedeutung** [Land and sea winds on the coast of Usedom Island and their bioclimatic imp
tance]. *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologisch
Dienst, Abhandlungen*, No. 44, 1957. 70 p. 35 figs., 40 refs.

C. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Acta Meteorologica Sinica, Peking, Vol. 29, No. 1, Feb. 1958

Yang, Ta-cheng and Tseng, Kwang: **The influence of the surface's roughness upon the wi
profile in the upper planetary boundary layer over Dairen,** p. 1–6
Chang, Yen: **A test of graphical method for quantitative precipitation forecasting,** p. 7–15
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Chu, Pao-chen: **A hydrodynamical model for seasonal variation of general circulation and lon
range forecasting,** p. 57–62

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Fu, Pao-p'o: **On the computation of possible maximum freezing depth and possible lowest ground temperature,** p. 63–72

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Koo, Chen-chao: **On the equivalency of formulations of weather forecasting as an initial value problem and as an "evolution" problem,** p. 93–98

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Chzhan, Ku-Ia: **Long-period changes in typhoon frequency and their relation to secular variations of atmospheric circulation patterns,** p. 135–138

Koo, Chen-chao: [**Review of**] **C. L. Godske: Dynamic meteorology and weather forecasting,** p. 139–141

ademiia Nauk SSSR, Izvestiia, Ser. Geofiz., No. 6, June 1958

Shuleĭkin, V. V.; Gushchin, V. F. and Peskov, P. I.: **Kolebaniia teplovogo balansa Atlanticheskogo okeana,** [Fluctuations in the heat balance of the Atlantic Ocean], p. 729–740

Kazanskiĭ, A. B. and Monin, A. S.: **O turbulentnom rezhime v prizemnom sloe vozdukha pri neustoĭchivoĭ stratifikatsii,** [The turbulent regime in the air layer near the ground with unstable stratification], p. 741–751

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Bocharov, E. I.: **Oslablenie infrakrasnoĭ radiatsii vodnymi tumanami,** [Attenuation of infrared radiation through fog], p. 791–795

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[**Obituary note on C. G. Rossby**], p. 800

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Mamaev, O. I.: **O vliianii stratifikatsii na vertikal'noe turbulentnoe peremeshivanie v more,** [Influence of stratification on vertical turbulent mixing in the seas], p. 870–875

Vul'fson, N. I.: **Statisticheskie metody opredeleniia deĭstvitel'nykh parametrov konvektivnykh potokov po nabliudaemym,** [Statistical methods of determining effective parameters of convective currents according to observation], p. 876–890

Tsvang, L. R. and Gutman, L. N.: **Izmerenie spektra legkikh atmosfernykh ionov,** [Measurement of spectra of small atmospheric ions], p. 891–902

Litvinov, I. V.: **Spektral'noe raspredelenie kapel' v dozhdiakh, obrazovannykh taianiem grada,** [Distribution spectrum of raindrops formed from melting hail], p. 903–912

Bocharov, E. I. and Krutikov, A. S.: **Pogloshchenie radiatsii v zhidkoĭ vode,** [Radiation absorption in liquid water], p. 923–926

Matveev, L. T.: **Kolichestvennye kharakteristiki turbulentnogo obmena v verkhneĭ troposfere i nizhneĭ stratosfere,** [Quantitative characteristics of turbulent exchange in the upper troposphere and lower stratosphere], p. 927–931

Voprosy geotermiki na XI General'noĭ assamblee Mezhdunarodnogo geodezicheskogo i geofizicheskogo soiuza v Toronto, [Geothermal topics at the 11th General Assembly of the International Union of Geodesy and Geophysics at Toronto], p. 932–933

Soveshchanie po mikroseĭsmam, [Conference on microseisms], p. 933–934

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No. 8, Aug. 1958

Legen'kov, A. P.: **Ploskie svobodnye kolebaniia ideal'noĭ odnorodnoĭ zhidkosti v beskonechnom kanale peremennogo secheniia,** [Plane, free oscillations of an ideal homogeneous liquid in an infinite channel of varying cross section], p. 989–994

Malkevich, M. S.: **Vliianie gorizontal'nykh izmeneniĭ al'bedo podstilaiushcheĭ poverkhnosti na rasseianie sveta v odnorodnoĭ atmosfere,** [Influence of horizontal albedo variations of the underlying surface on the scattering of light in a homogeneous atmosphere], p. 995–1005

Bulinskaia, N. A. and Zhavoronkina, T. K.: **O proiskhozhdenii soleĭ v atmosfere,** [Origi salts in the atmosphere], p. 1006–1014

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Veshniakov, N. V.: **O nekotorykh oshibkakh opredeleniia azimuta mikroseĭsm po met troĭnykh stantsiĭ,** [Certain errors in determining the azimuth of microseisms by tripa stations], p. 1020–1025

Rykunov, L. N. and Prosvirnin, V. M.: **Ob iskazhenii azimutov na istochnik mikrosei vyzyvaemom usloviiami ikh rasprostraneniia,** [Distortion of the azimuth for the so of microseisms due to their propagation conditions], p. 1026–1028

Kostina, A. F.: **O sviazi mikroseĭsmicheskikh kolebaniĭ, nabliudaemykh v Krymu, s mete logicheskoĭ obstanovkoĭ nad Chernym morem,** [The relation between microseismic osc tions observed in Crimea and meteorological conditions over the Black Sea], p. 1029–1

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Barsukov, O. M.: **Variatsii preimushchestvennogo napravleniia i sredneĭ amplitudy koro periodicheskikh kolebaniĭ telluricheskikh tokov,** [Variations in the preferred direction mean amplitude of short-period oscillations of telluric currents], p. 1040–1043

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Akademiia Nauk SSSR. Energeticheskiĭ Institut, Ispol'zovanie solnechnoĭ energii, Sborn [Utilization of solar energy, Collection 1]. Issued Moscow, 1957.

Baum, V. A.: **Vozmozhnosti ispol'zovaniia solnechnoĭ energii,** [Possible utilization of s energy], p. 7–23

Iaroslavtsev, I. N.: **O kolebaniiakh summ teploty ot radiatsii solntsa i neba i raspredel energii etikh radiatsiĭ vo vremeni dlia Tashkenta,** [Variations in heat sums from solar sky radiation and the temporal energy distribution of these radiations at Tashkent], p. 2

Veĭnbert, V. B.: **Koeffitsient ulavlivaniia priemnikom radiatsii, otrazhennoĭ ot parab tsilindricheskikh i paraboloidal'nykh zerkal,** [Efficiency coefficient of receivers of radia reflected from parabolic-cyclindrical and paraboloid mirrors], p. 32–40

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Garf, B. A.: **Mechanizmy vrashcheniia podvizhnykh solnechnykh ustanovok,** [Rota mechanism of mobile solar installations], p. 62–84

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Brdlik, P. M.: **Ispytanie i raschet solnechnykh opresnitel'nykh ustanovok,** [Test and calcula of solar water desalination installations], p. 136–150

Aparisi, R. R.: **Eksperimental'naia ustanovka dlia polucheniia vysokikh temperatur,** [Ex mental installation for producing high temperatures], p. 151–162

Garf, B. A.: **Malaia solnechnaia kukhnia,** [Small solar cooker], p. 163–171

Garf, B. A. and Khuntsariia, R. K.: **Parabolo-tsilindricheskaia ustanovka proizvoditel'nost'iu 40 l kipiatka v chas,** [Parabolic-cylindrical installation with an output of 40 liters an hour of boiling water], p. 172–176

Petukhov, B. V.: **Metod rascheta solnechnykh vodonagrevateleĭ,** [Design calculations for solar water heaters], p. 177–201

Markov, G. I. and Rekant, N. B.: **Ispytaniia solnechnykh vodonagrevateleĭ v Tashkente v 1952–1953 gg.,** [Tests with solar water heaters at Tashkent in 1952–1953], p. 202–209

Markov, G. I.: **Koeffitsient zateneniia priamoĭ solnechnoĭ radiatsii osteklennym perepletom geliopriemnika i kolichestvo priamoĭ solnechnoĭ radiatsii, padaiushcheĭ na priemnik,** [Shielding coefficient for direct solar radiation of the glass cover of a solar receiver and the amount of direct solar radiation incident on the receiver], p. 210–213

Poiarkov, S. G.: **Tekhniko-ekonomicheskie pokazateli solnechnykh ustanovok,** [Technico-economical indexes of solar installations], p. 214–231

Ismailova, A. A.: **Vozmozhnosti ispol'zovaniia solnechnoĭ energii dlia sushki fruktov i ovoshcheĭ,** [Possibility of utilizing solar energy for fruit and vegetable drying], p. 232–247

na-Ata, Kazakhstan. Kazakhskiĭ Nauchno-Issledovatel'skiĭ Gidrometeorologicheskiĭ Institut, Trudy, No. 5, 1955

Kavetskiĭ, S. P. and Shkalikov, F. V.: **Metod prognoza srednikh mesiachnykh urovneĭ gruntovykh vod,** [Method of forecasting the mean monthly ground water level], p. 3–7

Molchanov, A. L.: **O vodopogloshchaiushcheĭ sposobnosti raspakhannykh, zalezhnykh i zaniatykh pod lesonasazhdeniia chernozemov,** [Water absorbing capacity of cultivated and fallow chernozem and chernozem in afforested areas], p. 8–15

Korovin, V. I.: **Sposob prognoza raskhodov vody v istokakh rek, vytekaiushchikh iz ozer,** [Method of forecasting water discharge at the source of rivers flowing out of lakes], p. 16–19

Kavetskiĭ, S. P. and Kalmynkina, E. M.: **O stoke vzveshennykh nanosov rek severnogo sklona Zailiĭskogo Ala-Tau,** [The discharge of suspensions in rivers on the southern slope of the Trans Ili Ala-Tau], p. 20–25

Korovin, V. I.: **O prognoze vodnosti i skhoda snezhnogo pokrova v verkhov'e basseĭna r. Ilek,** [Forecast of the water content and the disappearance of snow cover in the upper region of the Ilek River basin], p. 26–30

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Gel'mgol'ts, N. F.: **Aerologicheskiĭ analiz atmosfernoĭ zasushlivosti v zapadnom Kazakhstane,** [Aerological analysis of atmospheric aridity in western Kazakhstan], p. 44–76

Bezverkhniaia, P. Ts.: **Sinopticheskie usloviia atmosfernoĭ zasushlivosti v zapadnom Kazakhstane,** [Synoptic conditions of atmospheric aridity in western Kazakhstan], p. 77–88

Bezverkhniĭ, Sh. A.: **Ozonometricheskie dannye po Alma-Ate v sopostavlenii s nekotorymi meteorologicheskimi faktorami,** [Ozonometric data for Alma-Ata as compared to some meteorological factors], p. 89–100

Prokhrov, I. I.: **O vychislenii glubiny promerzaniia pochvy,** [Calculation of the depth of soil freezing], p. 101–115

Komissarova, L. N.: **Povtoriaemost' iuzhnykh tsiklonov nad Sredneĭ Azieĭ i Kazakhstanom,** [Recurrence of southern cyclones over Central Asia and Kazakhstan], p. 116–121

No. 6, 1956

Golubov, R. S.: **Sinoptiko-klimaticheskoe opisanie Kazakhstana,** [Synoptic-climatological description of Kazakhstan], p. 3–21

Duletovà, T. A.: **Ob ustoĭchivosti v razvitii atmosfernykh protsessov,** [Stability in the development of atmospheric processes], p. 22–31

Baĭdal, M. Kh.: **Nekotorye osobennosti preobrazovaniia sezonnykh makrosinopticheskikh protsessov,** [Some characteristics of the modification of seasonal macrosynoptic processes], p. 33–47

Baĭdal, M. Kh.: **Povtoriaemost' estestvennykh sinopticheskikh periodov s zapadno-vostochnoĭ tsirkuliatsieĭ,** [Recurrence of natural synoptic periods with a west-east circulation], p. 48–55

Komissarova, L. N.: **O mesiachnom ritme,** [On the monthly periodicity], p. 56–59

Serebriakova, A. A. and Grebeniuk, E. V.: **Aerosinopticheskiĭ analiz usloviĭ vypadeniia obil'nykh dozhdeĭ na severe Kazakhstana,** [Aerosynoptic analysis of conditions leading to heavy rains in northern Kazakhstan], p. 60–67

Parfenova, G. I.: **Aerosinopticheskie usloviia vozniknoveniia frontal'nykh groz v Iugo-vosto nom i Vostochnom Kazakhstane,** [Aerosynoptic conditions leading to frontal thun storms in southeastern and eastern Kazakhstan], p. 68–82

Shchukina, N. F. and Kuvaldina, E. D.: **Sinopticheskie usloviia severnykh vtorzheniĭ na iu vostochnye raĭony Kazakhstana,** [Synoptic conditions leading to northern outbreaks i the southeastern regions of Kazakhstan], p. 83–100

Fetisov, K. V.: **Lokal'nye izmeneniia davleniia vozdukha, obuslovlennye mestnymi izmene iami skorosti vetra,** [Local air pressure changes conditioned by local changes in w velocity], p. 101–103

American Meteorological Society, Bulletin, Vol. 39, No. 7, July 1958

Jordan, C. L.: **Estimation of surface central pressures in tropical cyclones from aircraft servations,** p. 345–352

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AMS translation project: contents of Meteorologiia i Gidrologiia No. 1 and No. 2, Jan. and F 1958, p. 390–393

Angola. Serviço Meteorológico, Miscelanea Geofisica [pub. by the Serviço Meteorológ in commemoration of its 10th anniversary]. Luanda, 1956.

Keil, Karl: **Ein bibliographischer Beitrag über die Anfänge meteorologischer Studien in Ang vor 1950,** [Bibliographical contribution on the beginning of meteorological studies Angola before 1950], p. 1–10

Egedal, J.: **Lunar influences on geophysical elements in the equatorial region,** p. 11–12

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Herrinck, P.: **Analyse de la variation annuelle et semi-annuelle de la fréquence critique d couche F_2 à Léopoldville-Binza,** [Analysis of the annual and semiannual variation of critical frequency of the F_2 layer at Léopoldville-Binza], p. 155–162

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Bourguignon, R.: **Sur la détermination de la densité-altitude des aérodromes du Congo-Belge,** [Determination of the density-altitude of airfields in the Belgian Congo], p. 344–355

Bernard, Etienne A. and Frère, Michel: **Une expression pratique de l'évaporation potentielle d'une surface naturelle en climat tropical,** [Practical expression of potential evaporation from a natural surface in a tropical climate], p. 356–366

gola. Serviço Meteorológico, Luanda, Publications.

Annuals available as of 1955

Elementos meteorológicos de Angola (anual), [Meteorological elements of Angola: annual]. Available, 1944–1952. Price 50$00 each.

Anuario meteorológico do Observatorio João Capelo, Luanda, [Meteorological annual of the Joao Capelo Observatory, Luanda]. Available, 1953–. Price 50$00 each.

Observações meteorológicas de superficie em Angola (anual), [Meteorological surface observations in Angola: annual]. Available, 1953–. Price 50$00 each.

Observações meteorológicas de altitude em Angola (anual), [Upper air meteorological observations: annual]. Available, 1953–. Price 50$00 each.

Resultados das observações meteorológicas (mensal), [Results of meteorological observations: monthly]. Available April 1954–. Price 5$00 each.

Tabelas diversas (anual) de dados astronomicos, mares, etc., [Various tables, annual, of astronomical, sea, etc. data]. Available, 1951, 1953–. Price 20$00 each.

Publications available as of 1955

Leal, F. A. and Queiroz, D. X. de: **Distribuição da precipitação na Provincia de Angola,** [Rainfall distribution in the Province of Angola]. 1952. Price 50$00.

Contribuição para o I Congresso dos Economistas Portugueses, [Contribution for the First Congress of Portuguese Economists]. 1955. Price 100$00.

Portugal, J. B. de: **Assistência meteorológica e geofísica às actividades econômicas de Angola,** [Meteorological and geophysical service to the economic activities of Angola]. 1955. Price 20$00.

Queiroz, D. X. de: **Variabilidade das chuvas em Angola,** [Rainfall variations in Angola]. 1955. Price 20$00.

Vieira, A. da Gama: **A Secção de Geofísica do Serviço Meteorológico de Angola,** [The Geophysical Section of the Meteorological Service of Angola]. 1955. Price 20$00.

Carreta, A. Ferreira: **O problema da precipitação artificialmente provocada,** [The problem of artificially induced rainfall]. 1955. Price 20$00.

O clima de Angola, [Climate of Angola]. 1955. Price 10$00.

Bibliografia meteorológica e geofísica de Angola, [Bibliography of meteorology and geophysics of Angola]. 1955. Price 10$00.

Portugal, J. B. de: **Introdução ao estudo das correntes de jacto,** [Introduction to the study of jet streams]. 1955. Price 20$00.

Queiroz, Dario X. de: **Valores medios mensais e anuais representativos de elementos climáticos em Angola,** [Monthly and annual means of climatic elements in Angola], 1955.

Queiroz, D. X. de: **Precipitação e produção de algodão no Concelho de Icolo e Bengo,** [Rainfall and cotton production in the Icolo-Bengo District]. 1956.

Forthcoming publications

Carreto, Antonio F.: **Contribuição para o estudo da meteorologia dinamica de Angola,** [Contribution to the study of the dinamic meteorology of Angola].

Australian Journal of Physics, Melbourne, Vol. 11, No. 2, June 1958

Taylor, R. J.: **Thermal structures in the lowest layers of the atmosphere,** p. 168–176
Loughhead, R. E. and Bray, R. J.: **The Wilson effect in sunspots,** p. 177–184
Bray, R. J. and Loughhead, R. E.: **The lifetime of sunspot penumbra filaments,** p. 185–19
Giovanelli, R. G. and McCabe, Marie K.: **The flare-surge event,** p. 191–200
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Gazzard, A. D.: **Lunar tides in E_{2s} at Brisbane,** p. 272

Canadian Journal of Physics, Ottawa, Vol. 36, No. 6, June 1958

Abbott, W. N.: **Displacements of the radiant point during the auroral disturbance of Septem 22, 1957,** p. 643–648
Hartz, T. R.: **Auroral radiation at 500 Mc.,** p. 677–682
Demers, Pierre: **Théorie de la diffusion au cours du développement des couches ionographi épaisses,** [Theory of diffusion during the development of thick ionospheric lay p. 704–706
Adey, A. W. and Heikkila, W. J.: **Measurements of fluctuations of atmospheric temperat** p. 802–804

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Katzman, J.: **A cosmic ray increase related to solar activity,** p. 807–814
Fenton, A. G.; Fenton, K. B. and Rose, D. C.: **The variation of sea level cosmic ray inte between 1954 and 1957,** p. 824–839
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Isono, K.; Komabayasi, M.; Yamanaka, Y. and Fujita, H.: **Experimental investigation o growth of ice crystals in a super-cooled fog.** (Paper No. 89.) [Reprint from *Meteorolo Society of Japan, Journal,* 34(3):158–163, June 1956]
Syōno, S.; Gambo, K.; Miyakoda, K.; Aihara, M. and Manabe, S.: **A note on the barotr forecast using a moving coordinate system.** (Paper No. 90.) [Reprint, *Ibid.*, 34(3): 168, June 1955]
Isono, K.; Fujita, H. and Komabayasi, M.: **Change in droplets spectrum and water con of a cloud induced by salt water seeding.** (Paper No. 91.) [Reprint, *Ibid.*, 34(4):177– Aug. 1956]
Katow, K.: **Analysis of tropospheric structure during the Baiu season in 1954.** (Paper No. [Reprint, *Ibid.*, 34(4):190–201, Aug. 1956]
Miyakoda, K.: **Forecasting formula of precipitation and the problem of conveyance of w vapour.** (Paper No. 93.) [Reprint, *Ibid.*, 34(4):212–225, Aug. 1956]
Gambo, K.; Saito, N.; Fujiwara, S. and Murakami, T.: **Topographical effects on the nume weather prediction in the lower atmosphere.** (Paper No. 94.) [Reprint, *Ibid.*, 34(5): 265, Oct. 1956]
Miyakoda, K.: **On a method of solving the balance equation.** (Paper No. 95.) [Rep *Ibid.*, 34(6):364–367, Dec. 1956]
Manabe, S.: **On the contribution of heat released by condensation to the change in pres pattern.** (Paper No. 96.) [Reprint, *Ibid.*, 34(6):308–320, Dec. 1956]
Syōno, S. and Aihara, M.: **Some characteristic features of barotropic disturbances, P** (Paper No. 97, Pt. 1.) [Reprint, *Ibid.*, 35(1):12–18, Feb. 1957]
Syōno, S. and Aihara, M.: **Some characteristic features of barotropic disturbances, P** (Paper No. 97, Pt. 2.) [Reprint, *Ibid.*, 35(2):128–136, April 1957]
Syōno, S. and Yanai, M.: **Relationship between the pressure pattern and the wind.** (P No. 98.) [Reprint, *Ibid.*, 35(1):19–25, Feb. 1957]

Isono, K.: **On ice-forming nuclei.** (Paper No. 99.) [Reprint, *Ibid.*, 35(1):67–70, Feb. 1957]
Miyakoda, K.: **On the relation between solar incidence and cloud coverage.** (Paper No. 100.) [Reprint, *Ibid.*, 35(2):94–104, April 1957]

fisica Pura e Applicata, Milan, Vol. 40, 1958

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ernational Journal of Bioclimatology and Biometeorology (issued by the International Society of Bioclimatology and Biometeorology, Leiden, Holland), Vol. 2, 1958. Ed. by S. W. Tromp. Loose-leaf. Each article repaged.

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urnal of Atmospheric and Terrestrial Physics, New York, Vol. 12, No. 4, 1958

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Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy, No. 62(124), 1956

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